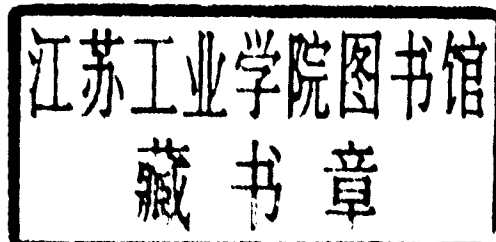

TAPPI PROCEEDINGS 1997

1997 Polymers, Laminations, &
Coatings Conference
Book 1

August 24-28, 1997
Sheraton Centre
Toronto, Ontario, Canada

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TAPPI

Technology Park/Atlanta
P.O. Box 105113
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TAPPI's Antitrust Policy and Compliance Procedures

"Accomplishment of these objectives is everyone's responsibility. We also urge you to advise your colleagues and corporate officers of TAPPI's ... compliance program"

This article sets forth TAPPI's antitrust policy and the rules of conduct and compliance procedures which govern all TAPPI activities. These formal guidelines are intended to do two things: (1) to prevent the occurrence of an actual antitrust violation in the course of TAPPI activities, and (2) to prevent inadvertent conduct which might give the appearance of an antitrust violation to someone unfamiliar with TAPPI's nature and purposes. They are designed to protect you, your employer and TAPPI from any accusation of wrongdoing arising out of your participation in TAPPI activities.

Accomplishment of these objectives is everyone's responsibility. We urge you to keep this article handy, and to refer to it whenever you have any question about the antitrust implications of any activity you might undertake under the auspices of TAPPI. We also urge you to advise your colleagues and corporate officers of TAPPI's comprehensive antitrust compliance program, so that you can count on their continued support in your TAPPI activities.

Any questions you or your company's legal counsel may have concerning TAPPI's antitrust compliance program should be directed to the Executive Director, TAPPI, Technology Park/Atlanta, P.O. Box 105113, Atlanta, Georgia 30348-5113 or to TAPPI's antitrust counsel, Peter Kontio, Alston & Bird, One Atlantic Center, 1201 West Peachtree Street, Atlanta, GA 30309; Phone (404) 881-7000; TELE FAX (404) 881-7777.

STATEMENT OF ANTITRUST POLICY

TAPPI is a professional and scientific association organized to further the application of the sciences in the paper and related industries. Its aim is to promote research and education in the areas of interest of its members. TAPPI is not intended to, and may not, play any role in the competitive decisions of its members or their employers, or in any way restrict competition in the paper and related industries.

Through its short courses, technical conferences and other activities, TAPPI brings together representatives of competitors in the paper and allied industries. Although the subject matter of TAPPI activities is normally technical in nature, and although the purpose of these activities is principally educational and there is no intent to restrain competition in any manner, nevertheless the Board of Directors recognizes the possibility that the Association and its activities could be seen by some as an opportunity for anticompetitive conduct. For this reason, the Board has taken the opportunity, through this statement of policy, to make clear its unequivocal support for the policy of competition served by the antitrust laws and its uncompromising intent to comply strictly in all respects with those laws.

In addition to the Association's firm commitment to the principle of competition served by the antitrust laws, the penalties which may be imposed upon both the Association and its individual and corporate members involved in any violation of the antitrust laws are so severe that good business judgment demands that every effort be made to avoid any such violation. Certain violations of the Sherman Act, such as price-fixing, are felony crimes for which individuals may be imprisoned for up to three (3) years or fined up to \$350,000, or both, and corporations can be fined up to \$10 million for each offense. In addition, treble damage claims by private parties (including class actions) for antitrust violations are extremely expensive to litigate and can result in judgments of a magnitude which could destroy the Association and seriously affect the financial interests of its members.

It shall be the responsibility of every member of TAPPI to be guided by TAPPI's policy of strict compliance with the antitrust laws in all TAPPI activities. It shall be the special responsibility of committee chairmen, Association officers, and officers of Local Sections to ensure that this policy is known and adhered to in the course of activities pursued under their leadership.

To assist the TAPPI staff and all its officers, directors, committee chairmen, and Local Section officers in recognizing situations which may raise the appearance of an antitrust problem, the Board will as a matter of policy furnish to each of such persons the Association's General Rules of Antitrust Compliance. The Association will also make available general legal advice when questions arise as to the manner in which the antitrust laws may apply to the activities of TAPPI or any committee or Section thereof.

Antitrust compliance is the responsibility of every TAPPI member. Any violation of the TAPPI General Rules of Antitrust Compliance or this general policy will result in immediate suspension from membership in the Association and immediate removal from any Association office held by a member violating this policy.

TAPPI GUIDELINES FOR SUBMITTING COPIES OF CORRESPONDENCE TO TAPPI HEADQUARTERS

TAPPI headquarters needs to remain aware of what particular committees and Sections of TAPPI are doing or are planning to do in order to better assist those groups in achieving their objectives and to continue to supervise actively the antitrust compliance of TAPPI. The Board of Directors of TAPPI therefore has adopted this formal statement of TAPPI's policy which requires that persons corresponding or receiving correspondence on behalf of TAPPI provide copies of the type of correspondence outlined below to the appropriate liaison person at TAPPI headquarters.

For this policy TAPPI does not require copies of routine, written communications regarding arrangements for speakers, meetings, travel, dinner reservations and the like.

TAPPI headquarters does require that copies of correspondence of an important nature and of non-routine matters be supplied in a timely fashion to TAPPI headquarters personnel connected with the committee or Section involved as shown below:

1. Plans regarding the activities of TAPPI committees or Sections.
2. Communications with other TAPPI committees or Sections.
3. Communications with persons or organizations outside TAPPI.
4. All written or recurring verbal complaints or criticisms of TAPPI activities.

All correspondence falling under the above-stated policy must be forwarded promptly to the appropriate TAPPI headquarters liaison person, preferably at the time of transmittal or receipt.

TAPPI GUIDELINES FOR MANUFACTURING PLANT TOURS

Manufacturing plant tours in connection with TAPPI technical program activities provide an opportunity for observation of applied science and technology. On-site inspection of equipment and processes by program attendees serves to promote knowledge of advances in manufacturing processes. Sponsored plant tours are conducted for the purpose of promoting understanding of production techniques and alternative approaches to technical problems in areas such as safety, pollution control, noise abatement and energy conservation. They may also promote the practical education of new TAPPI members and student members.

TAPPI's General Rules of Antitrust Compliance forbid the use of any TAPPI activity, including plant tours, for the purpose of exchanging competitive information.

In order to assure compliance with TAPPI's antitrust policy and general rules in connection with plant tours, the TAPPI Board of Directors has adopted the following supplemental guidelines to cover the plant tour portion of TAPPI programs:

1. Participation in plant tours should be limited to meeting registrants.
2. Plant tours should not include any discussion or exchange of competitive information.
3. Participants in plant tours should not under any circumstances discuss or otherwise disclose proprietary information.
4. Plant tour participants should not divulge to each other any operating data which could be used to reveal competitive information.
5. Plant tour participants may discuss the productive capacity of particular processes or items of equipment, but may not discuss the planned utilization of such productive capacity by the host plant or any other producer.
6. Plant tour participants may discuss production cost savings which may be effected through the use of a particular process or piece of equipment, but may not discuss the overall production costs of the host plant or any other producer.
7. The plant tour is to be conducted in compliance with TAPPI's Antitrust and Plant Tour Guidelines outlined in these pages, as well as the rules and directives of the host plant. While TAPPI encourages participation by all registrants for the plant tour, a host plant may decide to restrict or limit tour participation. It is the responsibility of those arranging plant tours to inform affected registrants of the restrictions as far in advance of the tour date as possible.

GUIDELINES FOR ANTITRUST COMPLIANCE BY DIVISION AND COMMITTEE OFFICERS

DO's and DON'Ts for Meetings and Operations

DO send the agenda for all meetings to TAPPI headquarters c/o Technical

Division Administrator 15 days prior to the meeting.

DO send all minutes to TAPPI headquarters 30 days after the meeting.

DO review TAPPI Antitrust Policy and General Rules of Antitrust Compliance prior to the meeting.

DO stop any discussion which appears to be leading to:

(a) discussion of prices or pricing policy,

(b) any restraint on competition of any kind.

DO advise all meeting attendees to observe the General Rules of Antitrust Compliance in informal conversations as well as formal TAPPI activities.

DO NOT place constraints on committee membership, other than the member's technical capability in the area covered by the committee and the willingness of the committee member to participate actively in committee work.

DO NOT undertake any committee activity involving collection or dissemination of prices or pricing methods.

DO NOT undertake any committee activity involving collection of individual firm cost data or dissemination of any compilation of such data without prior approval of TAPPI legal counsel.

DO NOT undertake any activity to establish a product standard or specification. All test methods must be cleared by TAPPI headquarters prior to publication.

DO NOT set a numerical limit on committee size unless membership on the committee is rotated on a regular and reasonable basis. You may set a numerical limit on the maximum number of representatives per company.

RECOMMENDATIONS FOR THE SELECTION OF SPEAKERS

TAPPI technical sessions at conferences and short courses are not designed to be sales forums; they are designed to provide a forum for the exchange of technical information. Nevertheless, employees of suppliers are sometimes asked to participate as speakers or panelists because of their knowledge and experience. Participation on the program of a conference or short course may be viewed by suppliers as a significant competitive opportunity, and the favoring of some suppliers over others can give rise to antitrust problems.

The exclusion of a supplier from a panel or program will not be considered an antitrust violation unless it constitutes an unreasonable restraint on competition. The key to "reasonableness" in this area is fair-minded decision making based upon objective criteria. In order to be fair to all suppliers and to avoid a charge of acting unreasonably to deprive any supplier of a significant competitive opportunity, TAPPI session developers should in all cases observe the following guidelines:

1. No speaker should be chosen with the intent to afford his company a competitive advantage, and no speaker should be excluded with the intent to deny any company a competitive opportunity.
2. Speakers should be chosen individually on the basis of objective criteria reasonably related to the educational purpose of the session, such as technical knowledge, experience, professional reputation, and effectiveness as a speaker.
3. The criteria to be used in selecting speakers should be established prior to the actual selection of speakers.
4. Supplier participation should be planned so as to minimize any competitive advantage which might arise from participation in a TAPPI activity.
5. Consideration should be given by session developers to all available methods for equalizing the competitive opportunity among suppliers.

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Extrusion Coating - Ask the Experts Panel Discussion

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Introduction

The technical experts invited to sit on this panel bring more than 100 years of combined experience in the converting industry to the table. They have spent those years keeping up with the latest technology in equipment, resins, paper, films and adhesion. The panelists have instructed academic courses and presented a plethora of technical papers on the subject of extrusion coating, and are seasoned experts in making both old and new equipment run smoothly. All in all, they have seen, heard and experienced just about everything under the sun that is related to the extrusion coating process.

The panel session is a forum for the audience to challenge the best minds in the industry with issues related to extrusion coating. The following are some timely and practical topics for discussion submitted by the panelists.

Scott Marks

Internally Deckled Extrusion Coating Dies:

The last time I was asked to participate in a panel discussion, internally deckled dies of the "Japanese" style were just starting to be looked at in the USA. Internal edge bead control on extrusion coating dies has been around for a long time, however the Japanese began to expand beyond the small EBR rod to large internal deckles in the land areas and T-slot plugs to help streamline out dead flow zones. This allows for much greater shaping of the edges of the melt curtain to try to minimize edge bead formation and thus wastage of polymer. In that panel discussion I was asked by a member of the audience my opinion of these dies and were they worthwhile? The question was fielded to me as I had experience with these dies in Asia. My reply was that they were indeed worthwhile and should be evaluated in the Americas and Europe. While they may not be the best applicable die in all cases, they would be found to be worthwhile in many extrusion coating operations.

At the time of that panel discussion, the only internally deckled dies available in the market were imports from Japan. Today, there are several manufacturers of dies in the USA that offer this style of die along with the externally

deckles type. In fact, some of the USA die producers are exporting their dies to Asia in competition with Japanese dies.

Over the past few years there have been a number of these dies placed on lines in North America, and I have heard both positive and negative feedback. Some of the negatives related to design considerations from the new suppliers of these dies, and have lead to design upgrades. Other negatives have likely been from the major issue revolving around these dies globally. That being,many companies that install them are not properly trained on how to run them and how to refine them in house to their particular needs. This is not the fault of the equipment supplier, as they also are not the experts in how to run them on a production basis. Nor are the resin suppliers. This is an issue with no one party being fully responsible. Given the variations in equipment designs, and resin rheologies, the parties really need to work together to best understand how the resin processing is influenced by the die design.

This is actually a very old problem, as I've found that converters in Asia where these dies have been in use for a long time, also do not really understand how to use these dies to their full advantage beyond basic coating of LDPE. While LDPE is indeed the bulk of what is coated, there are a number of other resins and copolymers in broad useage today, as well as coextrusion coating. Many of these I-D dies were set up to run PE in the range of 6-8 MI. If you place another rheology polymer in the die and do not "tune" the set-up to the different resin, you do not gain the benefits of reduced edge bead. You either get processing problems at the edges or higher edge bead wasteage such as on externally deckled dies.

One item that is of concern at this juncture in time is in the area of retrofit dies. It will come to be known that not all of the older dies can be properly retrofit to function as an internal deckle die. Brand new dies will need to be purchased in many cases to take advantage of this technology. I have recently been exposed to some dies that have been high pressure types or coathanger types, and they have been re-engineered to include internal deckles. Some unusual occurrences have come out of these retrofits, such as the issue of resin drawability being not

as forgiving in this type die and is instead more sensitive to resin rheological properties. "Why" is not fully understood yet....

Fred Singer

Construction of multi-ply laminations in flexible converting (for that matter in any converting industry) involves adhesion of interfaces. These interfaces are adhered via movement of a fluid layer (extrudate) on to a stable layer, or via an adhesion promoter (primer or adhesive) between stable layers, or both. Among those engaged in various aspects of these processes, a matter that too often is misunderstood is the difference between wetting and adhesion.

Wetting can be accomplished without adhesion, but adhesion cannot be accomplished without wetting. The difference must be recognized.

Who is responsible for spreading this word although it really is old news? Is it the supplier of primer, adhesive, resin, or film or the builder of the extruder or the treater?

In reality, all of the above have a stake in this work.

Ray Edwards

Hot Issues:

- a) Narrow molecular weight (MWD) polyethylenes have shown properties comparable to, or exceeding those of, linear low density polyethylenes. Why not, then, narrow MWD's?
- b) Are linear low density polyethylenes and metallocenes merely new gimmicks? Will they fill an existing need, or will markets have to be developed for them?
- c) Edge bead reduction dies: What are their pros and cons?
- d) Obtaining thinner coatings with polyesters through the use of new aqueous primers.
- e) The need for worthwhile extensional flow measurements in extrusion coating.

f) Screws with fixed mixing sections: Mixing screws generate work on polymers which are out of the control of the extrusion operator. The work is dependent, among other parameters, the rotational speed of the mixing screw. And not all applications, e.g., natural polymers, require extensive mixing. In these cases, why not revert to the traditional screw with no mixing sections, with its work determined by a pressure valve in full control of the extrusion operator?

Held at the TAPPI PLC Conference
August 25, 1997 in Toronto, Canada

FILM EXTRUSION PRIMER

Presenters:

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ABSTRACT

The film extrusion primer will be an overview of both the blown (tubular) and cast (flat) film extrusion processes. This session will begin with an introduction to polymer characteristics and how they affect the processing behavior and film properties. Following this will be a description of both the blown and cast film processes covering the function of the major components used in each process. The session will conclude with a presentation on specialty polymers and their applications to coextruded films.

ADDITIVES PRIMER TUTORIAL

Scott J. Melrose
Account Representative
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Tinley Park, IL 60477-9301

ABSTRACT

The purpose of the Additives Primer Tutorial is to provide a basic understanding of the traditional mainstream uses of common additives used in plastics. We recommend this session for those who:

- are new to the industry and need a basic understanding of additives
- are unfamiliar with one or more of the additives
- need a less stressful session prior to hitting the hospitality suites
- want a review prior to attending other additive papers
- want to develop contacts with the additive papers
- want to develop contacts with the additive suppliers and users
- already visited CN Tower and the Sky Dome during ANTEC

We've modeled the format on the successful extrusion primer tutorial also held on Monday afternoon. Please join us and add your input as we share our experiences in the wonderful world of plastics additives.

UV STABILIZERS AND ANTIOXIDANTS

R. E. King, III
Senior Staff Scientist
CIBA Specialty Minerals
Tarrytown, NY 10591

ABSTRACT

Antioxidants: Primer on What, When, Why and How They are
Used in Polyolefins.

UV Stabilizers: Primer on What, When, Why and How They are
Used in Polyolefins.
