

TAPPI Press

11th TAPPI European Place Conference 2007



May 14-16, 2007
Athens, Greece

Volume 2 of 3

TAPPI Press

11th TAPPI European Place Conference 2007

May 14-16, 2007
Athens, Greece

Volume 2 of 3



Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571
www.proceedings.com

ISBN: 978-1-60560-509-8

Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2007) by TAPPI Press.
All rights reserved.

For permission requests, please contact TAPPI Press
at the address below.

TAPPI Press
15 Technology Parkway South
Norcross, GA 30092

About this conference

The 11th TAPPI European PLACE Conference - (Polymers, Lamination, Adhesives, Coating & Extrusions) hosted at the Westin Athens Astir Palace Beach Resort in Athens, Greece- May 2007.

Attendees experienced the beauty and culture of Greece while enjoying the premier technical event for the European Flexible Packaging and Converting Industry. The conference program has a special emphasis on the latest trends, applications and technologies affecting the film extrusion, extrusion coating and end use applications including:

- New developments in polymers: raw material, the processing and converting
- What is new in machinery, extrusion and process controls
- Final products, environmental aspects and packaging
- Characterization of raw materials

TAPPI Press

11th TAPPI European Place Conference
2007

TABLE OF CONTENTS

Volume 1

An Overview of Food Contact Legislation of Multilayers	1
<i>R. Veraart</i>	
Impact of EU Reach Regulation on the Packaging Supply	36
<i>H.K. Onusseit</i>	
Tubular LDPE has the Extrusion Coating Future	87
<i>M. Neilen</i>	
Particularities of Extrusion to Design Peelable Structures for PP, PS, PET & PVC Substrates	97
<i>J. Pascal</i>	
New Developments in Plexar® tie-layer Adhesives	123
<i>M.G. Botros</i>	
What Can Happen to Polymer Granules from the Supplier's Silo to the Extruder Hopper?	175
<i>O. Plassmann</i>	
Printed Intelligence in Packaging	217
<i>E. Hurme</i>	
Protecting Brand While Gaining Operational Efficiencies with Item Level RFID	243
<i>K. Viskari</i>	
Additives for Polyolefins: Chemistry Involved and Innovative Effects	268
<i>M. Destro</i>	
Resin Characteristics and Interaction with Die Design	311
<i>G. Oliver</i>	
Improved Process Performance of Flat Dies by a Much Wider Die Gap Operation Window and a New Surface Finish of the Die Body	340
<i>O. Plassmann</i>	
Modern Extrusion Coating Die Technology	367
<i>S.G. Iuliano</i>	
Getting More Performance from an Existing Extrusion Coating Dryer	401
<i>W.R. Henry</i>	
Organic, Natural Pigments As Paper Coatings	440
<i>J. Raukola</i>	
Clear Barrier at Atmospheric Pressure	452
<i>R.A. Wolf</i>	
Low Cost Extrusion Coating Improvements	482
<i>L.W. Piffer</i>	
Aqueous Dispersions of Polyolefins	567
<i>R. Wevers</i>	

Volume 2

Coating of Polyester Film with Thin Wax Layers	600
<i>B. Daetwyler</i>	
How Gravure Coating Can Eliminate "MUDA" Waste	664
<i>F. Umbach</i>	
Reduction of Downtime, Quality Improvement and Customer Satisfaction with High Speed Web Inspection Systems	688
<i>M. Lehmkoetter</i>	
Online Quality Control of Polymers and Extruded Films	738
<i>O. Hissmann</i>	
Real-time and In-line Optical Monitoring of Functional Nano-layer Deposition on Flexible Polymeric Substrates	795
<i>S. Logothetidis</i>	
Industrial Inline Control for Advanced Vacuum Coating Roll to Roll System	869
<i>G. Steiniger</i>	
Transparent High Barrier Laminates Manufactured by Extrusion Lamination Process	902
<i>H.R. Naegeli</i>	
New Tools for Aroma Barrier Testing	929
<i>M.O. Vaha-Nissi</i>	
Adhesion to Foil - More Than Just a One-sided Story	963
<i>G. Schubert</i>	
Advances in Airtight Paperboard Packaging	1000
<i>J. Jarvinen</i>	
Prediction of WVTR with General Regression Models	1023
<i>K. Lahtinen</i>	
Analysis of the Free Surface Instabilities in Extrusion/Coextrusion Flows for Metallocene Based Polyolefins	1055
<i>J. Vlcek</i>	
A Model to Predict the Ability of a Flexible Package to Contain Materials	1110
<i>R.B. Allen</i>	
Optimisation of a Multi Layer Extrusion Flow by Varying Slip, Using Visco-elastic Simulations	1138
<i>M. Klaassen</i>	

Volume 3

Pet Extrusion Coating - Taking Extrusion Coating to a New Level	1164
<i>M.H. Peltovuori</i>	
A Comparison of Different Unwind and Splice Systems	1190
<i>M. Schroeder</i>	
Basic Polymer Rheology, as Related to Extrusion Coating Machinery	1225
<i>D.R. Constant</i>	

Developments in On-line Gauging of Complex Extrusion Coating - an Update.....	1271
<i>S. Schoneberger</i>	
Transparent Inorganic Barrierfilms	1300
<i>Thomas Glaw</i>	
Barrierfilm Production 9-Layer Blown-in Comparison with 9-Layer Cast Film	1339
<i>G. Winkler</i>	
The Use of Metallocene Polyethylene in Co-extruded Lamination Films	1344
<i>S. Viganò</i>	
Corona Experiences on Paper and Cardboard	1372
<i>R. Weber</i>	
Cold Atmospheric Plasma Technology for Surface Pretreatment and Coating.....	1398
<i>D. Vangeneugden</i>	
The Effects of Corona and Flame Treatment: Part 1: LDPE Coated Packaging Board.....	1446
<i>M. Tuominen</i>	
The Basics of the United States Food and Drug Administration's Regulations of Food Contact Materials	1488
<i>D.J. Ettinger</i>	
Elongational Viscosity in Quality Control Aspired Category: Characterization of Raw Materials	1529
<i>M. Stadlbauer</i>	
Relationship of Rheological Behaviour and Molecular Architecture for LDPE's Designed for Extrusion Coating	1554
<i>B. Nijhof</i>	
A 21st Century Toolbox for Characterizing Next Generation Extrusion Coating Resins	1579
<i>A.W. de Groot</i>	
Beyond the Hype - the Perspective of the Polyolefin Industry on Biomass-based and Biodegradable Polymers	1611
<i>S. Lhote</i>	
New Developments in Biopolymers for Film Extrusion	1628
<i>P. Bullock</i>	
The New Challenge for the Packaging Industry - Laminates in South-East Asia and China.....	1653
<i>I. Bueren</i>	

Author Index

AUTHOR INDEX

Allen, R. B.	1110	Umbach, F.	664
Botros, M. G.	123	Vaha-Nissi, M. O.	929
Bueren, I.	1653	Vangeneugden, D.	1398
Bullock, P.	1628	Veraart, R.	1
Constant, D. R.	1225	Vigano, S.	1344
Daetwyler, B.	600	Viskari, K.	243
De Groot, A. W.	1579	Vlcek, J.	1055
Destro, M.	268	Weber, R.	1372
Ettinger, D. J.	1488	Wevers, R.	567
Glaw, Thomas.	1300	Winkler, G.	1339
Henry, W. R.	401	Wolf, R. A.	452
Hissmann, O.	738		
Hurme, E.	217		
Iuliano, S. G.	367		
Jarvinen, J.	1000		
Klaassen, M.	1138		
Lahtinen, K.	1023		
Lehmkoetter, M.	688		
Lhote, S.	1611		
Logothetidis, S.	795		
Naegeli, H. R.	902		
Neilen, M.	87		
Nijhof, B.	1554		
Oliver, G.	311		
Onusseit, H. K.	36		
Pascal, J.	97		
Peltovuori, M. H.	1164		
Piffer, L. W.	482		
Plassmann, O.	175, 340		
Raukola, J.	440		
Schoneberger, S.	1271		
Schroeder, M.	1190		
Schubert, G.	963		
Stadlbauer, M.	1529		
Steiniger, G.	869		
Tuominen, M.	1446		

Coating of polyester film with thin wax layers

Bruno Dätwyler

Paper 7569 / Session 6.3

Polytype Converting AG

CH-1701 Fribourg, Switzerland

TAPPI PLACE Athens 14 – 16 May 2007

Summary

- Abstract
- Introduction to Thermal Transfer Technology
- Ribbon Structure of the company **ARMOR**
- Range of Application
- Development of the Wax Coating Method
- Quality Requirements to **Polytype**
- Acknowledgement

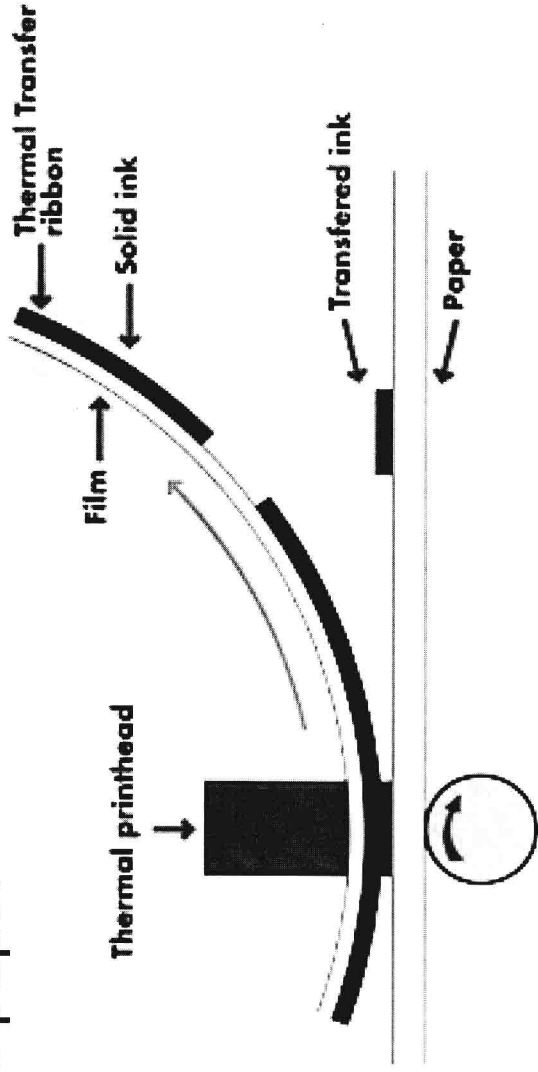
Abstract

- Special applications require coating of thin layers of molten wax onto thin polyester films. The coating is approximately 1.5 micron thick on a substrate of 4.5 micron thickness. The standards for coating quality and uniformity are high. In the **Polytype** Pilot Plant we analysed several coating methods. Criteria related to quality as well as productivity, in particular the line speed, have been used for selecting the optimum coating method.

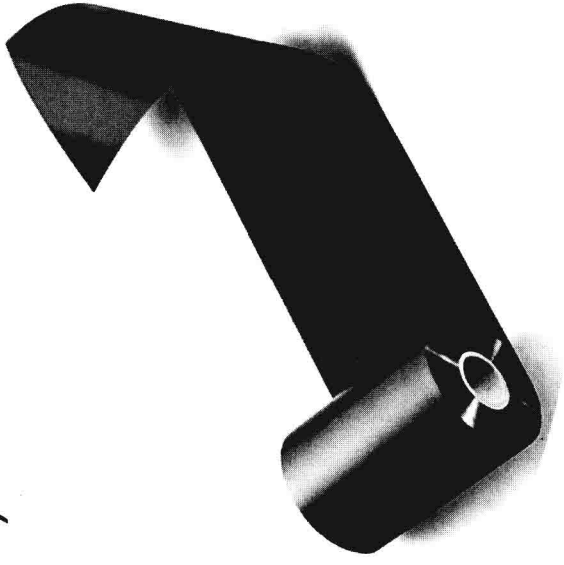
- History:
 - Thermal transfer is a 20 year old technology
 - Thermal transfer was created by a Japanese company, originally for printing the Kanji characters
 - At the same time automatic identification with Barcode technology started up
 - Both direct thermal and thermal transfer technologies were perfectly adapted for printing Barcodes and text
 - The new technology was introduced in Europe by

ARMOR

- Working Principal:
 - To deposit by means of a heat source thermo fusible ink on a substrate
 - The ink, coated on a polyester film, is solid at ambient temperature. Under the heated print head the ink becomes fluid and is transferred from the film to the paper

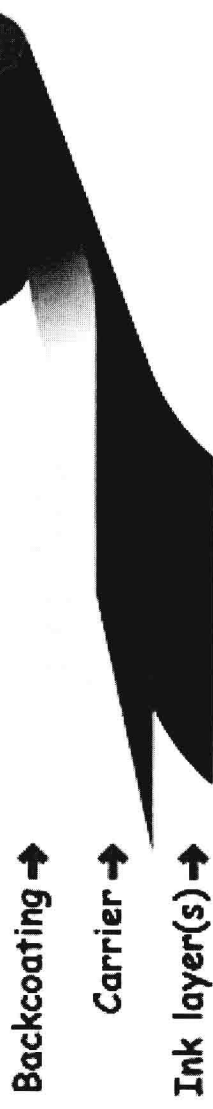


- Benefits:
 - Suitable for industrial environments
 - Low cost on demand printing
 - Ability to print on paper, film and textiles
 - Capability to print at high resolution
 - High speed printing ($> 1000\text{mm/s}$)
 - Large choice of ribbons



Ribbon Structure

- Structure:

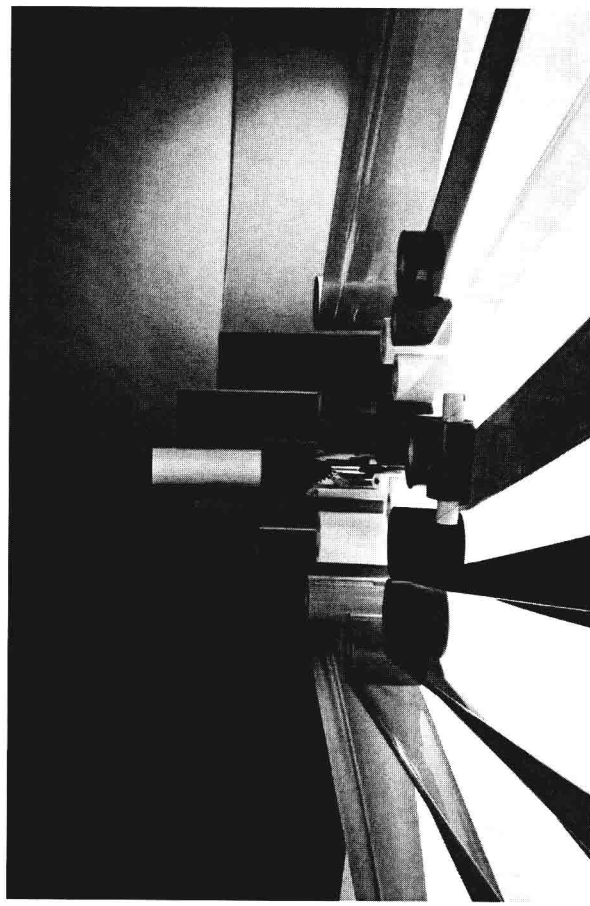


- The thermal transfer ribbon is a PET film upon which a thermofusible ink is deposited on one side and a protective layer called back coating on the other side.

Ribbon Structure

- The Back coating:
 - Non-abrasive (very low coefficient of friction)
 - Protects the print head
 - Helps to reduce static charging
 - Outstanding silicone based product
 - Perfect to avoid build up of dirt
 - Very high heat resistance
 - Prevents the film from burning
 - Thermal conductor
 - Favors an excellent ink transfer

Ribbon Structure



- The Carrier:
 - Characteristics
 - PET film
 - Thickness 3.2 – 5.0 μm
 - Mechanical features
 - High resistance to tearing
 - Thermal behavior
 - Good thermal conductivity
 - Very good heat resistance (melting point of film = 250°C)