



IPC Flex Conference

See you in Colorado!!!

Talk to your boss now! Get your trip approved and come to the IPC Conference on Flexible Circuitry. The conference will be held on Wednesday and Thursday, June 9th and 10th at the Holiday Inn at the Denver International Airport. There is also the opportunity to attend one of three full-day workshops that will be held on the day before the conference, Tuesday June 8th.

Tom Woznicki

The conference will begin with the keynote address by Walter Hinton, chief strategist for Storage Technology. The remainder of the day will feature thirty minute presentations on flex manufacturing and the worldwide industry outlook. *(continued on page two)*

ADFlex Works To Recover After Layoffs

Reduced sales to three key customers caused ADFlex Solutions, one of the largest flex circuit makers in the world, to lay off 20% of it's worldwide workforce in late April. Sales in 1Q99 were \$28.6 million, a drop of \$11 million from 4Q98.

ADFlex has always been extremely focused on large high-volume customers, such as Seagate, IBM, Maxtor and Motorola. Their philosophy is that it takes the same engineering time to service a low-volume program as it does a high-volume program, so by focusing exclusively on high-volume customers they can keep the number of front-end engineering people to a minimum. This is a good philosophy as long as your key customers prosper and they stay with you. But if one or two of your key customers leave or if their business slows your sales fall like a stone. As the saying goes, if you live by the sword, you die by the sword.

In a story by Business Wire on 4/21/99 it was reported that the sales drop was "due to technical difficulties experienced by two OEM customers unrelated to ADFlex, an inventory adjustment made by a third customer, and generally weaker demand." The company also took a \$6.9 million charge against earnings in 1Q99 and will post an additional charge of

\$2.6 million in 2Q99. The full story is available at http://biz.yahoo.com/bw/990421/az_adflex_1.html

In addition to reducing headcount, mostly production workers, ADFlex closed the advanced packaging prototype facility in the UK. All the engineers in the UK were laid off and the flip-chip assembly equipment has being shipped to Chandler, Arizona and to the new production facility in Thailand. They also closed two of their plants in Agua Prieta, Mexico, transferring the manufacturing to their new facility in Thailand.

ADFlex just posted it's 10Q filing with the SEC for 1Q99 which further explains it's first quarter financial figures. You can read it on the web at <http://www.sec.gov/Archives/edgar/data/925743/0000950153-99-000617.txt>

We certainly wish ADFlex good luck as they work to regain their financial footing. Moving production from Mexico to Thailand should go a long way to increasing sales and profitability. But, we do hate to see anyone lose their jobs. In particular, if you have a need for some good flex engineers, please contact us and we will put you in touch with those engineers from ADFlex UK.

The Flex Circuit News has links to the web pages of companies and individuals mentioned in the articles and advertisements. Web links are highlighted by this symbol.

Flex conference (continued from page one)

At the end of the day Wednesday there will be a reception and table top exhibits by vendors. On Thursday there will be presentations on advances in flex materials, flex in IC packages, commercial rigid-flex and flex circuit design. The conference agenda is listed on pages three and four.

If you can come in a day early, any of the workshops offered on Tuesday, June 8th will increase your understanding of flex circuitry. Details of the workshops are listed in the column on the right.

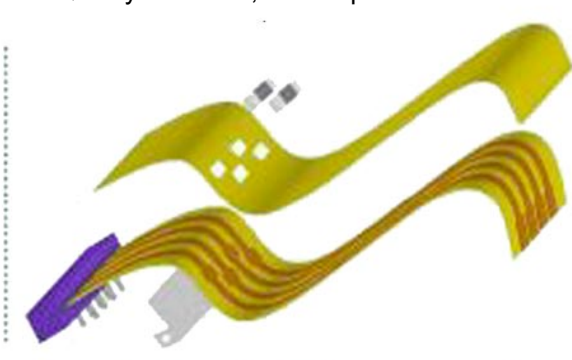
You can attend just the conference, just a workshop, or both. For IPC members the cost of the conference is \$425 and the workshop is \$350. If you want to attend both, the cost is \$695. For non-members, the cost is \$525 to attend the conference, \$450 for the workshops and \$795 to attend both. A registration form is on page five.

If you need a further inducement, Arapahoe Basin Ski Area is open until July 4th, so bring your skis or snowboard and catch some late-season snow! It's 96 miles west of Denver - take I-70 to exit 205 and then 12 miles east on US highway 6. Their web page is <http://www.arapahoebasin.com>.




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WORKSHOPS - TUESDAY JUNE 8TH 8:30AM - 4:00PM

W-01: Flex Circuit Fundamentals

Bill Jacobi of William Jacobi and Associates and Thomas Stearns of Brander International Consultants

Due to its thinness, light weight, ability to fold, and variety of applications, flexible circuitry is fast becoming the interconnection solution for many of today's electronic products. This workshop will focus on the manufacture, characteristics, and end uses of flexible circuitry. New material options, such as adhesiveless flex, and their effect on costs and processing will be covered along with critical design issues.

W-02: Principles of Flex Circuit Design

Russell Griffith, Tyco Printed Circuit Group

The enormous promise of flexible circuits cannot be realized without a thorough understanding of design principles. This course presents the electrical, mechanical and material properties of flex, and reviews the flex circuit manufacturing process. Designers will be taken through a checklist of considerations when utilizing flex circuits in their system packaging.

W-03: Flex as an Advanced Packaging Medium

Ken Gilleo of Poly-Flex Circuits Inc. and Joe Fjelstad of Tessera

Flexible circuitry has become a critical enabling technology. Unparalleled properties, including extreme thinness, high temperature stability, compliance and ultra-high density have made flex the premier chip carrier. This workshop will cover the special characteristics of flex and contrast the differences compared to rigid PCBs. A special section on flex-based chip carriers will include Flip Chip-on-Flex, TAB, TBGA and micro-BGAs. Other major topics will include materials, designs, processing, handling, applications and SMT assembly.

IPC 5th Annual National Conference on Flexible Circuits

Wednesday, June 9th

7:30am **Registration and Continental Breakfast**

8:30am **Keynote Address**
Walt Hinton, Chief Strategist
Storage Technology

9:00am **Flex Market Overview**
Bill Jacobi, Conference Chair,
William Jacobi & Assoc.

9:30am **Roadmap for High Density Flex Circuits**
Dominique Numakura, Parlex

10:00am **Fine Pitch Flex for Medical Applications**
Bill Burdick, GE Corporate Research

10:30am **BREAK**

10:45am **Comparison of Flexible Circuits to Traditional Round Wire Harness in Automotive Applications**
Shaun Sheehan, Pressac

11:15am **A Cost-Effective, Roll-to-Roll, Projection Lithography and Via Generation System**
Dr. Kanti Jain, Anvik Corp.

11:45am **LUNCH AND EXHIBITS**

1:15pm **Laser Beam Drilling of Flexible Circuits Based on Polysiloxane**
Sabine Kellermann,
Bavarian Laser Center Ltd.

1:45pm **Flex Circuits by Transfer Lamination**
Paul Kydd, Partnerships Limited

2:15pm **Singulating Polyimide Flex Circuits with UV-Laser Based Production Equipment**
Raymond Dick, Preco Industries

2:45pm **BREAK**

3:00pm **Laser Structuring of Fine Lines**
Dr. Dieter Meier, LPKF Laser & Electronics AG

3:30pm **Multilayer HDI Flex**
Bill Chou, Fujitsu Computer Packaging Technologies

4:00pm **A Progress Report on Flexible Circuit Standardization**
Thomas Gardeski, DuPont

4:30pm **EXHIBITS AND RECEPTION**

Thursday, June 10th

7:30am **Continental Breakfast**

8:00am **Flex for IC Packages**
Jan Vardaman, TechSearch International

8:30am **High Performance Rigid Flex at Commodity Pricing?**
James Keating, Teledyne

9:00am **Surface Finishes for Flip Chip on Flex**
Hazel Schofield, AdFlex Solutions

9:30am **Designing for Flexibility and Reliability**
Mark Finstad, Minco

10:00am **BREAK**

10:15am **Laminate Thickness Considerations in Impedance Controlled Flexible Circuit Design**
Art Creidler and Daniel Amey,
DuPont High Performance Materials



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Thursday, June 10th (continued)

- 10:45am **Adhesiveless Polyimide Substrates for Flexible Circuit Applications**
 Tad Bergstresser, Gould Electronics
- 11:15am **UV Curable Epoxide Technology for the 21st Century**
 Dr. Stanley Jasne, Jodan Technology
- 11:45am **LUNCH AND EXHIBITS**
- 1:15pm **Adhesion of Metal to Polymer – A Comparison Between Adhesiveless Polyimide, Adhesive-Based Polyimide and Liquid Crystal Polymer Substrates**
 Michael St. Lawrence, Rogers Corp.
- 1:45pm **Highly Dimensional Stable Polyimide Film & It's Applications**
 Hiroyuki Furutani, Kaneka Corp
- 2:15pm **BREAK**
- 2:30pm **Bendability of Fine Line Flex Circuits**
 Harish Merchant, Gould Electronics
- 3:00pm **Conversion of Wrought to Annealed Foil During Lamination**
 Dick Zwierlein, DuPont
- 3:30pm **Use of Z-Axis Conductive Adhesives to Make Flex to PWB Interconnections**
 Cam Murray, 3M



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Register by June 2nd. Call IPC at 1-847-790-5361 if deadline has passed or if you have questions.

REGISTRATION FORM: IPC 5TH ANNUAL NATIONAL CONFERENCE & WORKSHOPS ON FLEXIBLE CIRCUITS - JUNE 8-10, 1999

Please check appropriate box: I am a member of IPC (MB) I am not a member (NM)

<p>WORKSHOP REGISTRATION</p> <p><input type="checkbox"/> Workshops - \$350 (MB) or \$450 (NM) I am registering for one workshop on June 8th only. I am selecting Workshop (circle one): W-01 W-02 W-03</p>	<p>CONFERENCE REGISTRATION</p> <p><input type="checkbox"/> Conference - \$425 (MB) or \$525 (NM) I am registering for the Conference on June 9th - 10th only.</p> <p>SUPER PACKAGE SAVINGS REGISTRATION</p> <p><input type="checkbox"/> Conference and 1 Workshop - \$695 (MB) or \$795 (NM) I am selecting Workshop (circle one): W-01 W-02 W-03</p>
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METHOD OF PAYMENT: MY TOTAL COST is \$_____

Check enclosed and made payable to IPC

Bill P.O. number: _____ (IPC Members Only)

Charge my credit card (check one): Amex MasterCard Visa Diners Club

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Fax to: (847) 509-9798 Mail to: IPC, Dept. 77-3491, Chicago, IL 60678-3491 Code 300-30144

Tyco Santa Clara Receives Mil-Spec Certification

Victor Llanes, a very sharp flex engineer at Tyco in Santa Clara, informs me that the Tyco Santa Clara flex circuit facility has been certified to Mil-P-50884C for type 4 flex circuits. This is very good news because there were no flex shops in Northern California that were mil-spec certified. You can reach Tyco Santa Clara at 408-727-9169

DuPont Announces Joint Venture To Produce Adhesiveless Flex Materials

DuPont announced a joint venture with Bekaert Group of Kortrijk, Belgium to develop and supply adhesiveless flex circuit materials. They're building a manufacturing plant in Research Triangle Park, North Carolina that will be operational in the fourth quarter of 1999.

The new factory will produce base laminates using one and two mil Kapton E. Copper thicknesses between 5 microns and 18 microns will be available on one or two sides. The copper will be plated-up from a sputtered seed layer, and no secondary etching will be required.

Information on these new materials are not yet available on DuPont's web page. For information call Ray Jasinski at 1-919-248-5147.



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The Flex Circuit News is a bimonthly newsletter published by Tom Woznicki and Flex Circuit Design Company in San Jose, California. It is dedicated to providing information about all aspects of and promoting the use of flexible printed circuits in interconnection and electronic packaging.

The Flex Circuit News is a free publication that is delivered to subscribers by e-mail. To subscribe or unsubscribe, visit our web site at: www.flexdude.com.

To submit a story for *The Flex Circuit News*, send an abstract along with the author's credentials to: Twoznicki@AOL.com, or to the mail address below. For information on advertising in *Flex Circuit News*, contact Tom Woznicki at: Twoznicki@AOL.com or call 1.408.629.8343.

Flex Circuit Design Company is a consulting company that specializes in designing flexible printed circuits for OEMs and flex circuit manufacturers.

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about flex circuits?*

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