



ADDEX NEWS

SUMMER 2003

IN THIS ISSUE

- New Home
- SuperWind
- Chronology
- Tech Update
 - External Gauge Control EGC
 - All Digital Non Contact IBC
 - GBR
 - REDI Die
- New People: Frank Lübke
- Manual Gauge Control MGC
- Customer Profile: Deerfield Urethane
- Sales Meeting 2003
- Sales Representatives

NEW HOME FOR OUR DEMO LINE



SUPERWIND

The list of requirements that came out of the brainstorming session 4 years ago was long: This winder had to make very large rolls, occupy the smallest space possible and if it ended up being a surface winder, do away with all the shortcomings of surface winders, like being capable to reverse and gap wind.

And as if that wasn't enough, it also had to be competitively priced.

After many long hours, make it years, we ended up with SUPERWIND a surface winder with center assist for gap winding, that can make up to 58"/1475 mm diameter rolls, reverse wind easily because the cutting knife is embedded in the lay-on drum whereby the cutting can occur with the film riding over or under the drum. By choosing the stacked configuration SUPERWIND met also the floor space requirements. An 80" /2032 mm layflat SUPERWIND for example, takes up approximately 13x20'/3900 x 6120mm. The way we designed the winder we can change future designs to back to back or front to front configurations.

Taper Tension and Direct Torque Tension Control are standard. The Separation module includes a

secondary nip, an operator friendly Multiple Web Cutting System that allows trimming.

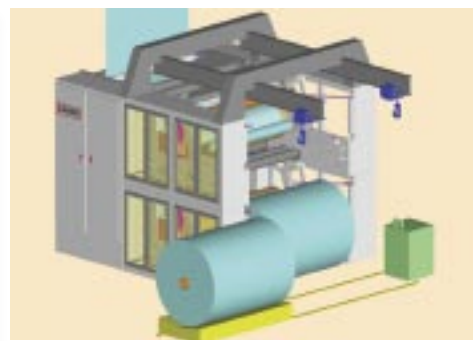
The maximum speed of the SUPERWIND is 500 fpm/153 m/m. It can run 0.5 mil/12 micron all the way up to 10 mil/250 micron thick films.

Optional equipment includes an integrated crane for Roll Removal and Empty Shaft/Core Loading and a Core Loading Station.

And yes, SUPERWIND is priced competitively !



- Large Roll Capable, 58"/1500mm
- Surface/Gap Winding
- Forward/Reverse Winding
- Cut-over Knife in Drum
- Direct Torque Tension Control
- Taper Tension
- Stackable, Front to Front or Back to Back
- Multiple Cuts
- Trim-less or Trim Capable



CHRONOLOGY

With SUPERWIND we completed the development of all major Blown Film Line components.

- | | |
|------|--------------------------------------|
| 1989 | 1-5 layer dies, air rings |
| 1990 | Non contact IBC control |
| 1991 | GBR Gauge Band Randomizer |
| 1992 | Extruder |
| 1994 | Side fed coex dies |
| 1995 | IGC Internal Gauge Control |
| 1999 | REDI Regular Division Dies |
| 2000 | EGC External Gauge Control |
| 2002 | Talon Computerized Full Line Control |
| 2003 | SUPERWIND |

TECH UPDATE

External Gauge Control (EGC)



EGC Air ring

Three years ago we developed a variation to our IBC based Automatic Gauge Control: the EGC (US patents 5,676,893 and 5,468,134). The EGC is based on our already recognized high performance Laminar Flow Air Ring, with 3-4 times the resolution of competitive systems of equivalent size, resulting in superior film thickness variation. For example a 16"/400mm system has 168 control zones.



Inside the EGC Air Ring

Digital IBC System

At K-'98, we introduced the next generation of IBC control. This all digital system has proved itself over the past 4 1/2 years in all sorts of applications where competitive systems failed: the long term control of bubble size of metallocenes, very small and very large bubbles and everything in-between.

We accomplished this by developing split-level sensing that separates the high speed short term control necessary for stability from the long-term control required for accurate sizing. We also addressed sensor interference problems, common to multiple sensor ultrasonic systems, by implementing a multi-point firing system which controls sensor sequencing so they do not hear one another. The digital signal processing system eliminates any stray signal like that of a treater. To complete the system, Addex developed the high speed linear servo valve, which provides a total system response time of .05 seconds, allowing for tight layflat of +/-1/16" to 3/32" or 1.5mm to 2.5mm even on a bubble not in contact with the bubble cage

"We have several Addex 3 layer installations in our plant the smallest having 4" IBC dies. Running small bubbles with IBC can be a challenge because of sensors interfering with each other. Two years ago we installed the first Addex all digital IBC control replacing their older version which combined analog with digital circuits. The difference on the small bubbles was extraordinary. Certain materials and sizes that couldn't run before are no more a problem with the new system. The bubble is stable and we can maximize the output."

John Weikert
NEWTECH PLASTICS COVINGTON OHIO

GBR

The Gauge Band Randomizer GBR is one of those dormant Addex products that is worth mentioning from time to time. It was the first product that we developed completely from scratch and has become the product of choice for any customer who is looking for reliability and versatility.

Our oscillating hauloff maintains a constant path length throughout the device at all times to prevent any impact on web speed over time. The horizontal design hauloff uses four independent bearing rings that surround the process for maximum stability. These rings are driven by a fixed mechanical gearset to precisely position a series of idler rolls and two turning bars to redirect the web through a full 360 degrees of rotation.

(US patents 5,727,723, 5,700,488, 5,567,445 and 5,360,328)

Gauge bands are randomized on the finished roll over time, thus the name Gauge Band Randomizer or GBR. The idlers and turning bars are arranged in a special way to allow the film to approach each turning bar from opposite directions. The normal web shift that occurs on each turning bar continues to occur, but now in equal and in opposite directions, thus canceling each other, in other words, you get an Anti-Web-Wander effect. Our "Easy-Float" turning bars are designed with high internal pressure and low total air flow to eliminate all turning bar adjustments and allow extremely sticky and/or stiff films to be processed



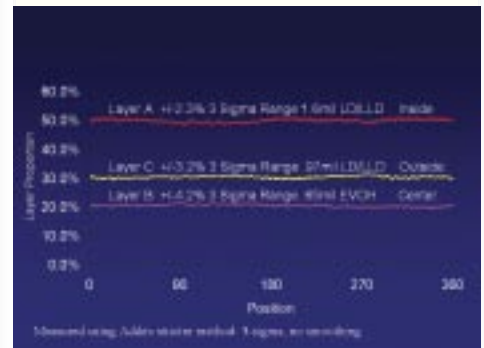
Delivering the GBR

REDI Technology

Our first REDI (REgular DIvision) dies seem rudimentary today more than three years into the life of this die technology. The changes reflect the higher demands of our customers for this revolutionary die design. Luckily enough the original REDI technology allowed all these enhancements.

The addition of the patented flow mixing channel and the elimination of any meltflow angle over 45 degrees improved the performance with expensive EVOHs, polyamides and tie layers.

By keeping the thickness tolerances within several percentage points of their intended target our customers are saving considerable money that cover within months the slightly higher cost of this technology. Only the REDI technology makes such tight control of the inside layers possible.



To convince doubters we have run a three layer structure of LDPE, EVOH and LDPE without tie layers. The absent tie layers allow you to peel the layers apart and measure their extraordinarily low thickness variations. On top of these advantages come also the lower residence times and larger IBC air exchanges that are inherent to any sideded die design.



7 Layer REDI before shipment

NEW PEOPLE

Frank Lübke Technical Support Manager



On February 14th 2003 Addex appointed Frank Lübke of Idstein (near Frankfurt) Germany to become its Technical Support Manager. Frank, 48 years old, has an engineering degree from the Stuttgart Technical University. His entire career has been dedicated to plastic processing technologies primarily the extruded blown film end of it. His longest tenure was at Paul Kiefel Extrusionstechnik with shorter stop-overs at Hoechst, Battenfeld and Reifenhaeuser. Frank is putting this extensive experience to work for Addex in providing customers and sales representatives with technical support. His efforts are essential in Addex's growing European presence as well as in many North American projects particularly those that include processing HDPE.

Welcome Frank !



CUSTOMER PROFILE

Deerfield Urethane a Bayer Company

"We are very pleased with our investment in Addex's sophisticated blown film equipment. The Addex modernization is a valuable addition to our production platform, and considerably improved our throughput"

Rick Baxendell
President @ CEO

Deerfield Urethane is a worldwide leader in Polyurethane Films. It produces thermoplastic polyurethane film and sheet-all specially formulated to meet individual customer specifications. Enhancing its unique customization capability, DU also offers the greatest choice of standard and custom colors in the industry. Established in 1978 it has grown rapidly. In 1996 it moved into a new expanded facility and is continuing its tradition of growth through customer satisfaction.

MANUAL GAUGE CONTROL AIR RING



MGC with 1/2 of the bolt cover

For more than a decade the Addex Dual Lip Air Ring has been the standard for the blown film industry, producing highest attainable output and best attainable gauge uniformity for film manufacturers worldwide. Based on this know-how Addex has developed a Manual Gauge Control air ring, MGC (patent pending), that permits selective adjustment to correct film gauge deviation caused by extruder, die or ambient anomalies by as much as 25% (several customers have achieved a 50% reduction). As an external (to the film bubble) film thickness control, it lends itself to manual operation, bringing it within a reasonable price range, and giving even the most cost conscious film manufacturer the opportunity to control his gauge deviation, to produce better



Each MGC air ring comes with a gauge that helps determine your adjustments

film for converting and, over time, to save money as a result of tighter gauge tolerances. Depending on die size, the MGC is equipped with anywhere from 100 to over 200 individually adjustable control bolts in 10mm (3/8") wide air channels, providing high resolution, yet requiring only average operator skills.



Eric Eichler, Addex Mechanical Engineer, makes sure the MGC is in good shape

Making gauge corrections with the MGC can best be compared to adjusting die bolts to make up for uneven film thickness distribution. A spot is marked on the film bubble, indicating its orientation, the gauge of the film sample with the marking is measured off line and plotted, and the relative adjusting bolts on the MGC are turned in or out to make corrections. The magnitude of correction per bolt turn can also be determined by before and after film measurements. Although the MGC lends itself to use with stationary as well as oscillating/rotating dies, the latter can control only about half the gauge deviations (those that are caused by the rotating parts) and requires a considerably higher operator skill level to accurately determine the position of the deviations and to relate corrective action back to the MGC. In addition to the MGC, Addex also manufactures a fully automatic External Gauge Control system (EGC) and an automatic Internal Gauge Control system.

SALES MEETING 2003

Every February, Addex's sales representatives, from all over the world, come together in Boston. The highlight this year was the unveiling of SUPERWIND. With this, Addex has developed all the components that make up a blown film line *from left to right*

Jim Godsey, Ohio Valley Sales Rep,
Eric P. Hatfield, FlexTech Managing Director,
Bob Cree, Addex Executive VP,
Rick von Kraus, Addex President



ADDEX REP LIST



UNITED STATES

Tony Vitolo Engineered Systems, Inc.
P.O. Box 627, Snellville, GA 30078-0627
Tel: 770-979-7429 Fax: 770-985-1932
E-mail: vitolo@ix.netcom.com

Mitch Shauf Plastics Network Agency, Inc.
1491 Kealy, Suite #12, Lewisville, TX 75057
Tel: 972-221-7171 Fax: 972-219-9759
Cell: 214-505-0284
E-mail: mitch@pnainc.net

Andrew J. Haesler Polymers & Machinery, Inc.
P.O. Box 2636, Westfield, NJ 07091
Tel: 212-673-7740 Fax: 212-217-9566
E-mail: ajhinc@aol.com

Bill Spartz Mike Spartz, Promac, Inc.
4240 Hampton Ave, Western Springs, IL 60558
Tel: 708-246-9330 Fax: 708-246-9266
Cell: BS-708-267-8435 MS-708-267-7973
E-mail: promac123@aol.com

Jim Godsey, Bill Hohenstein Thomas & James Automation
4130 Linden Ave, Suite 304, Dayton, OH 45432
Tel: 937-256-9500 Fax: 937-256-9560
E-mail: tjauto@worldnet.att.net

EUROPE

GERMANY

Herbert Aufderhaar
Brunhildstrasse 10, D-49479, Ibbenbueren, Germany
Tel: 49-5451-972-384 Fax: 49-5451-972-385
Cell: 49-171-7506-909
E-mail: H.Aufderhaar@osnanet.de

ITALY

Marco Zimmel Prochema SRL
Via Buonarroti, 175, I-20052 MONZA (MI) Italy
Tel: 39-039-281-561 Fax: 39-039-202-1525
/039-281-5629
E-mail: m.zimmel@prochema.it

FRANCE

Jerome Koenig Sarl Koenig Equipments-SKE
76, Rue Marius Augan, 92300 Levallois Perret, France
Tel: 33-147-590-821 Fax: 33-147-584-500
Cell: 33-609-164-265
E-mail: skej@wanadoo.fr

UK

Adrian Horrocks Norplas
Unit 1, Manor Farm Barn, Gosbeck
Ipswich, Suffolk, IP6 9SH, England
Tel: 44-1449-761-841 Fax: 44-1449-761-761
Cell: 44-802-793-683
E-mail: Adrian@norplas.co.uk

BENELUX

Jan Krouwel CH. Remy & Bienfait
Lolenlaan 39 A, 2251 CC Voorschoten NL, Holland
Tel: 31-71-561-4747 Fax: 31-71-561-4546
E-mail: jkrouwel@xs4all.nl

DENMARK

Jan Bruhn-Hansen Steffen Bruhn, e-b packing aps
Sindalsvej 8, DK-8240 Risskov, Denmark
Tel: 45-8621-7088 Fax: 45-8621-7388
E-mail: jbh@ebpcking.dk

MIDDLE EAST

Yaron Gutmark Dipl. Ing. M. Gutmark Ltd.
P.O.B. 37, Ramat-Hasharon, 47100, Israel
Tel: 972-3-5400-286 Fax: 972-3-549-3279
E-mail: gutmark@inter.net.il

Alper Behar Ekinoks
Levent Apartmani, No 20, Daire 3
80600 1. Levent-Istanbul, Turkey
Tel: 90-212-282-8775 Fax: 90-212-269-5966
Cell: 90-212-325-9411

PACIFIC RIM

E-mail: behar@ekinoks.com.tr
Y.C. Kong Dong Sung UTC
206-607 Seochang-Dong Namdong-Ku, Incheon, Korea
Tel: 82-32-465-4399 Fax: 82-32-465-563
Cell: 82-11-316-7517
E-mail: dsutc@unitel.co.kr

Darren & Ken Brown KMB International
4/39 Susan Street, Eltham 3095, Victoria, Australia
Tel: 61-39-439-5211 Fax: 61-39-439-1390
E-mail: sales@kmb.com.au



ADDEX INC • 154 Maple St • Stoughton • MA 02072 • USA • Tel 781 344 5800 • Fax 781 344 5766 • Email addex@addexinc.com • www.addexinc.com