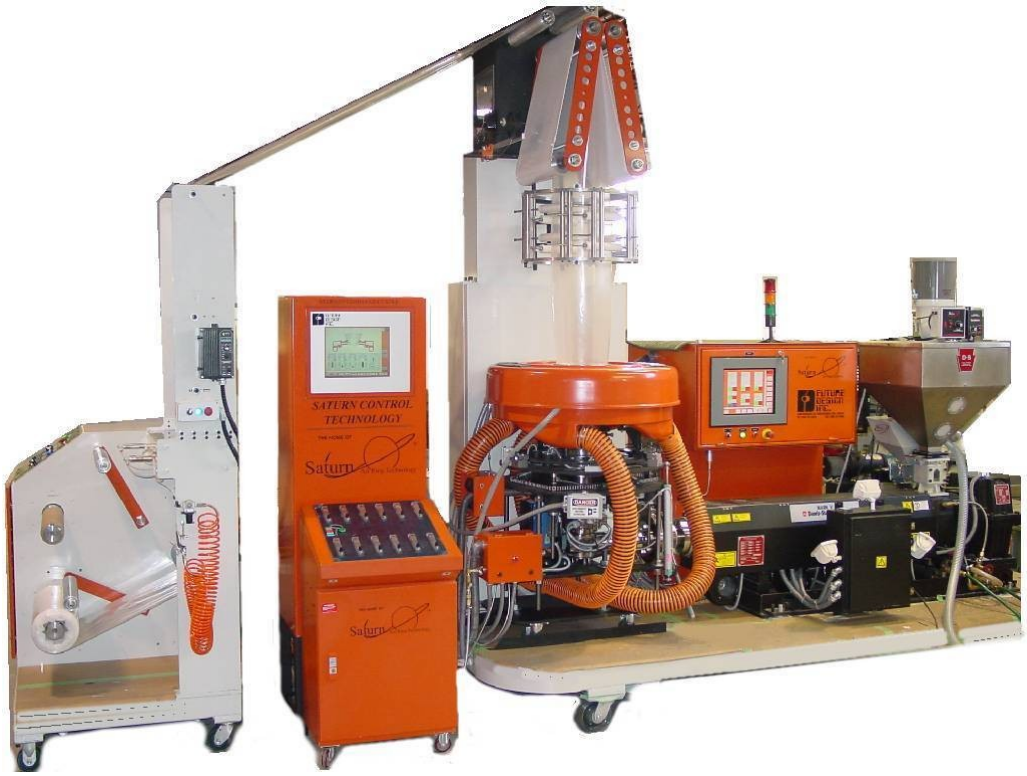
FUTURE DESIGN INC.



THE HOME OF SATURN AIR RING TECHNOLOGY™

BLOWN FILM EXTRUSION SYSTEM EQUIPMENT AND COMPONENTS

Future Design Inc.
5369 Maingate Drive, Mississauga, Ontario, Canada L4W 1G6
Telephone: 905-361-9978 | Fax: 905-361-9985 | Email: futurecan@saturn2.com | Website: www.saturn2.com

Top Nip Roll Assemblies & Collapsing Frames

Our **Top Nip Roll Assemblies** and **Collapsing Frames** provide flawless collapsing of the bubble with uniform film tension control, which reduces wrinkling of the film. We offer several alternative collapsing surface options including wooden slats, Teflon rollers and low-friction/high-slip slat covers for diverse types of applications. This will guarantee the best collapsing solution for your type of film.

FEATURES

Benefits:

- Easy film threading
- Virtually eliminates film drag
- Uniformly conveys the entire surface of the film
- Reduces inconsistencies in the web caused by surface drag

Design:

- Regulated nip pressure
- Dynamically balanced rolls
- Remote operation station including variable speed control
- Angular adjustment on the upper and lower parts of the collapsing system

Construction:

- Pneumatic open/close
- Steel frame construction
- Actuated rubber coated steel roll
- Fixed chrome drive roll
- Lead in/out idler rollers - safety stop system

Options:

- Wooden slats
- Teflon rollers
- Low-friction/high slip slat covers
- Conveyor collapsing design
- Carbon fiber collapsing rolls
- Side gusseting

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Saturn Escort Top Nip Collapsing System

The **Saturn Escort Top Nip Collapsing System** is the first truly unique idea to be applied to the often forgotten part of the blown film process: collapsing. The system incorporates the patented design of the unification of the collapsing surface and the nip rolls. Comprised of two converging conveyors, the speed of the belt surface is identical to that of the blown film bubble. This eliminates film marking, center sag and edge wrinkles while increasing film production and reducing process aids. It can also be retrofit to any existing line.

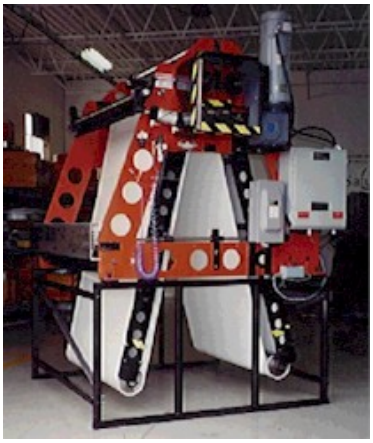
FEATURES

Benefits:

- Eliminates marks on film surface
- Reduces center sag and edge wrinkles
- Easily processes even the most difficult products
- Increases film production and line speed
- Forward and reverse of belts
- Eliminates friction

Design:

- The Saturn Escort incorporates a unique collapsing apparatus and two converging nip rolls into a single system designed to process flawless film.
- Belted conveyor system guides film at an identical speed.



USA patent # 6,565,343
Taiwan patent # 133493
Europe patent # EPO 963830

Construction:

- Blanchard ground side plates
- Fitted tie bars to ensure alignment
- Pneumatic open-close of nip rolls
- Speed regulator
- Electronic variable speed DC drive 3-5HP
- Forward/reverse of belts
- Acrylic safety guards
- Non-static belt with "V" guide tracking
- Temperature range of -20° C to +80° C
- Belt material - 2 ply monofilament polyester with white polyurethane top surface that meets current FDA regulations for use in contact with foodstuffs
- Easy design belt removal system
- Integrated on a single frame
- Prewired

Options:

- Drive selection
- Special belts - customized for difficult materials or high-temp applications
- Electric open-close of nip rolls
- Cantilevered design for ease of access and ease of start-up

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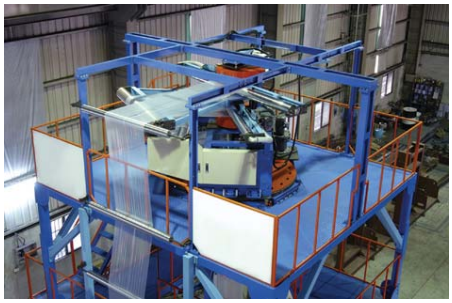
Horizontal Oscillating Haul-Off

The **Horizontal Oscillating Haul-Off** provides superior film gauge with 100% randomization of the bubble. The 360° oscillation distributes gauge variations throughout product rolls, providing flat rolls and superior roll geometry. Tower oscillation provides a constant web tension between the primary and secondary nips supplying excellent web profile for advanced blown film processing. Low tension operation makes randomization of the system favourable for films that are thin, tacky and/or stretchable.

FEATURES

Benefits:

- Stable tension across the width of the web eliminates wrinkles
- Continuous, smooth nip roll oscillation
- Superior profile of finished rolls
- Gives benefit over rotating/oscillating dies



Design:

- 360 degree oscillation
- Mounted on heavy duty thrust bearing
- Oscillating motor ½ HP with reducer and inverter control
- Two perforated aluminum cylinders, each with 1 HP high-efficiency air blower to provide air-pad to reduce the friction between the film and cylinder
- Control panel with emergency stop in proximity to the oscillation unit
- Take-up roller
- Pneumatic system for open/close
- 1 HP A.C. motor and inverter control

Construction:

- Heavy-duty plate
- Aluminum rollers
- Complete with operation platform (steel frame)
- Complete with three aluminum guide rollers
- Maximum take-up speed and voltage to be determined upon ordering

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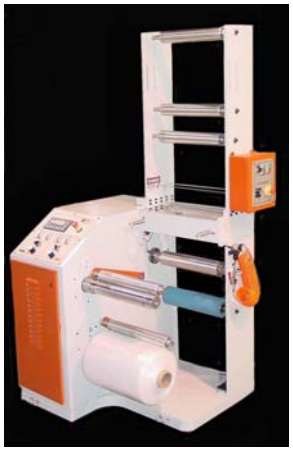
Saturn Narrow Web Winder

The **Saturn 'Little Giant' Winder** sets the standards for laboratory and narrow web production line winding. The footprint of this winder and the unique cantilevered design make the Little Giant an integral component of the Saturn Laboratory Systems.

FEATURES

Design:

- Cantilevered design for easy roll access and changeover
- Stand-alone unit
- Dual winding station with rewind capability
- Ease of maintenance
- Torque and pressure can be set preventing the use of any excessive force and eliminating safety issues.
- Simple rigid design
- Durable/Long life



Construction:

- Cantilevered design for easy roll access and changeover
- Dual winding station with rewind capability
- 3" core standard – other sizes available upon request
- Custom torque limiter control
- Pressurized air gun for inflation of rollers
- Heavy duty frame and base
- Secondary nip with separate speed and pressure control
- Pneumatic open/close
- Pneumatic filter & controls
- Lay on roll with pneumatically adjustable operating pressure to provide desired rolling force
- Torque and speed control designed to operate separately with reverse mode added to enable rewinding and unwinding
- Maximum film width 24"
- Maximum roll diameter 18"
- Spreader roll
- 2 E stops
- 2 spindle driver motors
- Solid state electronics
- Easy access for service
- 220 volt AC supply with low power consumption
- 80 p.s.i. air required
- Guards and covers
- Idler rollers, two stationary and one adjustable

Options:

- Slitting Station
- Top nip tack follower
- Customer specific requirements for tension sensors and control
- Wheeled base for easy maneuverability

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