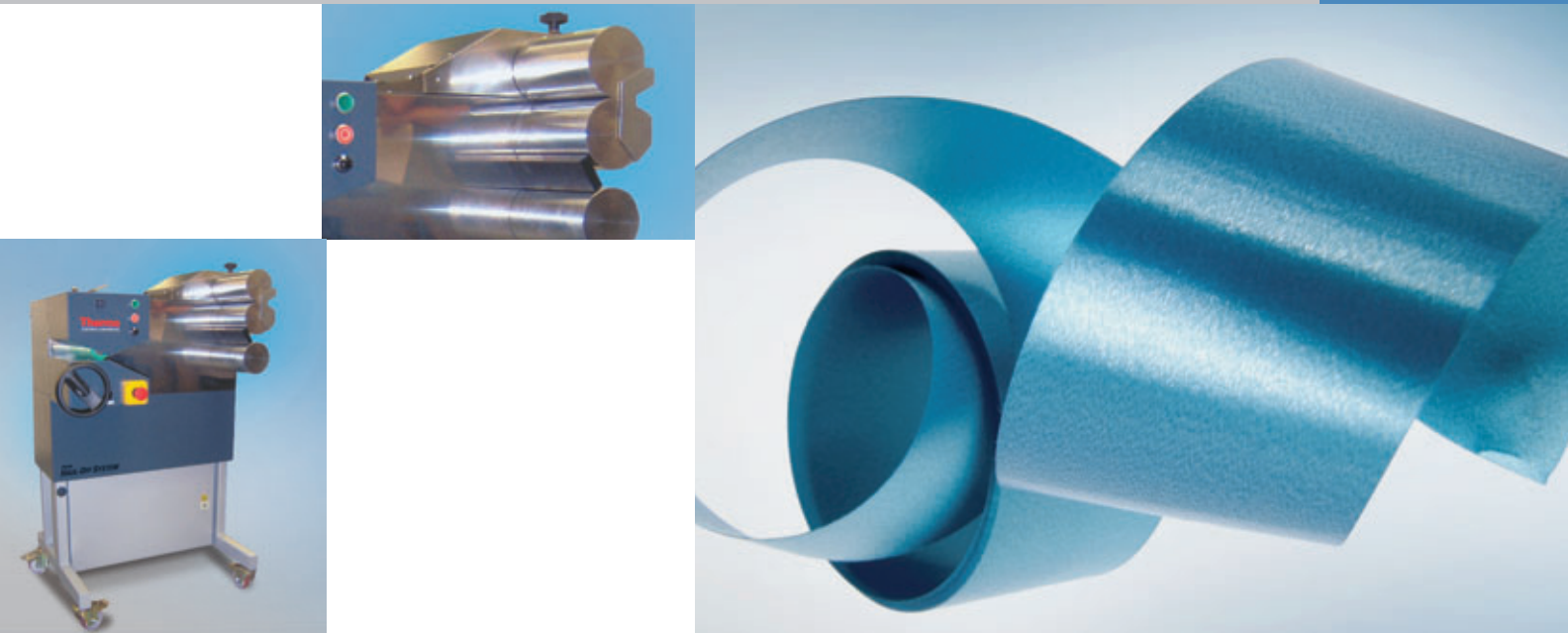


Laboratory testing of polymeric compounds often includes small-scale production simulation. In addition to monitoring a process, it is often desirable to use the extrudate material from a small-scale production run for further analytical investigations. Specific evaluation of this material – such as optical or physical testing – can provide detail regarding the success or failure of the extrusion process. To allow for these investigations, specialized systems must be utilized to accurately and continuously draw, form, cool, and transport material from the die of the extruder.

## Sheet and Ribbon

### Post Extrusion Haul-Off System



#### Applications:

- Profile Extrusion
- 2D Extrusion
- Sheet/Film Extrusion
- Three-Roll Stack
- Small-Scale Sheet/Film Production

#### The Applications

Thermo Electron's sheet and ribbon haul-off system can be used to accurately and continuously draw extruded sheet/ribbon/tape material from an extrusion process in a defined manner. The intelligent design allows for simplistic handling via single-side mounted rolls with variable height allowance for precise alignment to extrusion profile dies. Polished, liquid temperature-controlled chill rolls form a smooth and consistent product, while spring-loaded, rubberized pull rolls ensure proper tension and material draw.

Films produced with this system can be evaluated for:

- small-scale production simulation
- surface finish characteristic
- pigment dispersion
- transparency
- color distribution
- homogeneity/consistency
- gel particulates
- contamination and/or occlusions
- long-term material behavior (weatherability, Xenon test, etc.).

# Sheet and Ribbon Haul-Off System

## The Technology

Thermo's sheet and ribbon haul-off system is a fully functional, stand-alone type unit which can be combined with either laboratory or pilot plant extrusion lines. The sheet and ribbon haul-off features the following:

### Chill Roll Block

- two polished, chrome plated chill rolls; optional third nip (chill) roll
- provides extrudate with a smooth, consistent finish
- adjustable roll gap to the nip roll
- enables production of sheet/ribbon/tape material with a constant thickness up to 3 mm
- chill rolls allow for temperature control of material via separate liquid temperature control system (not included)
- versatile system allows functionality with a wide variety of materials
- all rolls are directly driven to eliminate frictional slippage
- variable speed range to allow for adaptation to extruder output capacity

### Pull Roll Block

- spring-loaded rubberized pull rolls
- adjustable speed ratio of the chill rolls to ensure film tension (0-10%)
- allows for compensation of uneven profiles, especially in start-up
- pull roll gap can be adjusted
- possibility for individual haul-off settings

### Winder (optional)

- optional winder with lateral traction
- allows for winding/collection of produced sheet/ribbon/tape
- automatic winder speed compensation
- eliminates necessity for diameter-dependent speed adjustments

## Thermo Electron Corporation

### Material Characterization

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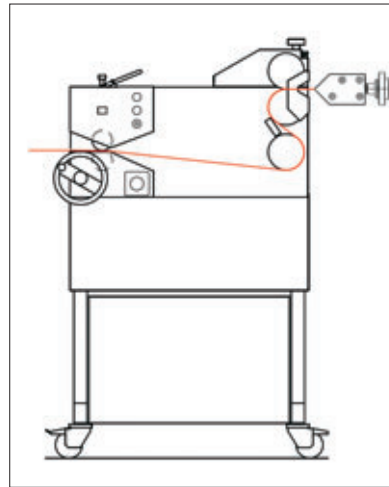
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554-1476 Two roll haul off with nip roll

### Speed Control

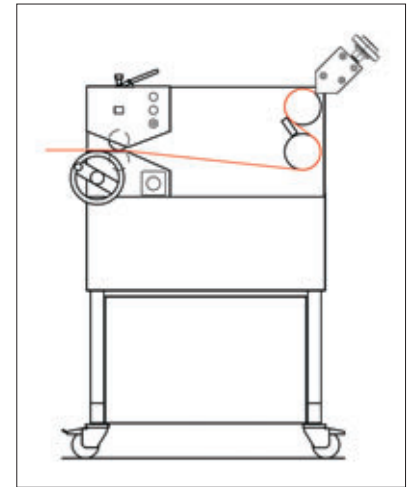
- electronic speed control
- manual or computer controlled-speed setting with data logging
- precise control for exceptional handling in start-up and test completion
- high resolution in low speed range
- elimination of 'jerking' at start-up, even at low haul-off speeds

### Handling

- mobile and compact unit
- variable height allowance for precise alignment to extrusion profile dies
- easy to use in the laboratory
- integrated drive unit
- ergonomic design
- operator-intuitive, fully integrated control electronics

### The Accessories

The sheet, tape and ribbon haul off is supplied as a ready-to-use unit. Depending on the respective application, only a laboratory circulator is required for temperature controlling the chill rollers:



554-1475 Two roll haul off

- Refrigerated P2-C35 circulator for temperature control within the 20 to 120 °C range. Suitable for polymers with low melt temperatures such as Polyolefins or PVC.
- Heating P2-B5 circulator for temperature control within the 50 to 120 °C range. Suitable for polymers with higher melt temperatures such as polyamide or LCP
- Two flexible steel hoses are required for temperatures above 80 °C.

### Technical specifications

#### Sheet and Ribbon Haul-off System

Roll diameter	110 mm
Roll width	200 mm
Roll surface	chrome – highly polished
Max. temperature	200 °C
Take off speed	0 - 10 m/min
Main supply	230V ±10 %, 50 - 60 Hz
Max. current	6 A
Dimensions (L/W/H)	570/1130/720 mm
Weight	165 kg