

Technical Realities of Manufacturing and Recycling Ag Films



What Are Agriculture Films?

Blown Films are used to make a wide range agriculture plastic products primarily used in the storage of feed and grains

- Grain Bags
- Silage Bags
- Silage Sheeting
- Bale Wrap



Why Are Agriculture Films Necessary?

Agriculture Films are instrumental in preserving feed for the beef and dairy industry, as well as for storing grain.

- Silage (chopped barley, corn, hay) is compacted into an air-tight storage bag where anaerobic fermentation occurs, stabilizing the feed and ensuring it maintains high quality and high nutritional value for up to two years.
- Silage can also be compacted into large piles or bunkers and covered with plastic silage sheeting to create an air-tight barrier and the same anaerobic fermentation as occurs in silage bags.
- Hay bales can be immediately wrapped with a stretch film to create baled silage/haylage in the same air-tight environment as bags.
- Grain is stored in bags at the time of harvest both as a means to increase temporary storage at a low cost AND as a harvest efficiency tool to not slow down harvest through trucking grain long distances to the farm site.



How Are Agriculture Films Made?

Agriculture Films are actually a blown plastic made from Polyethylene Resins.

- It is a Polymer:
 - A large molecule built up by the repetition of small, simple chemical units

Common types of polyethylene

- Low Density Polyethylene (LDPE)
- Linear Low Density Polyethylene (LLDPE)
- Butene (C4), Hexene (C6), Octene (C8)
- High Density Polyethylene (HDPE)
- Metallocene (m-LLDPE)

Polyethylene is a very broad term, encompassing literally thousands of resins

How Are Agriculture Films Made?

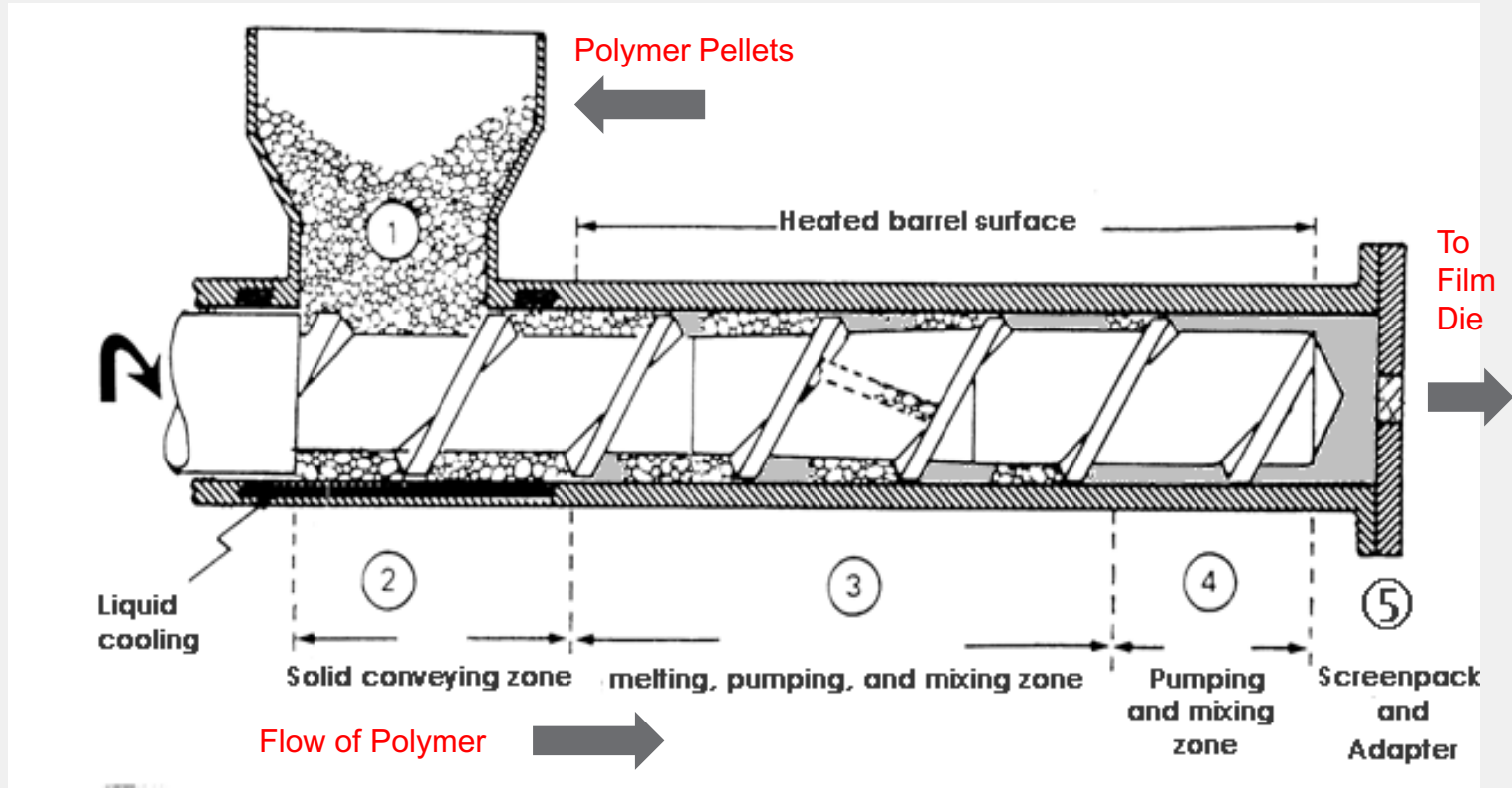
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- Simplistic Overview:
 - Melt, mix and push plastic out of extruder
 - Form the plastic via the die
 - Blow a bubble, control the bubble
 - Cool plastic, collapse bubble, fold film down to workable size, cut to length

Virgin Polymers are required to produce an Agriculture Film

- FDA Certified Polymers to produce solution safe for animal and human food storage
- Mechanical Strength Optimization
- Ultraviolet Light (UV) Stabilized for storage up to 2 years

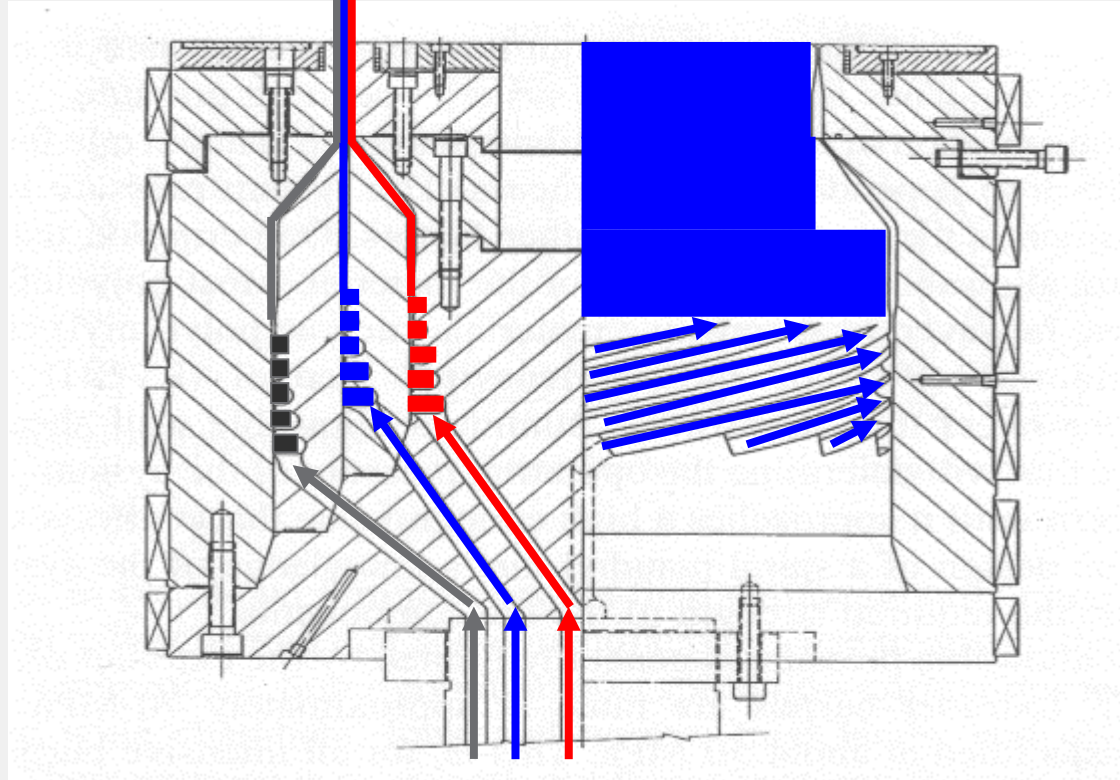
How Are Agriculture Films Made?



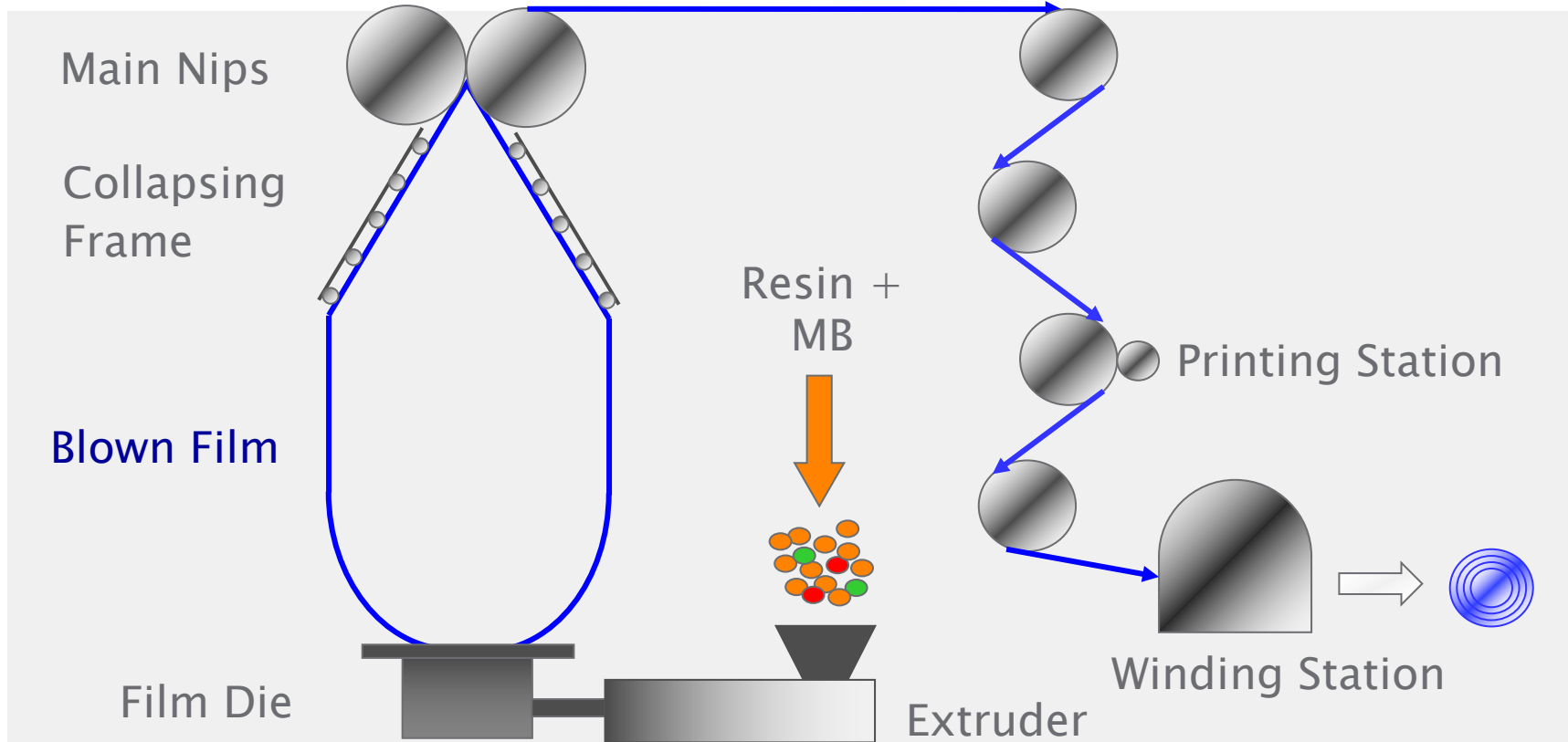
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Blown Film Die

- Three Layer Film



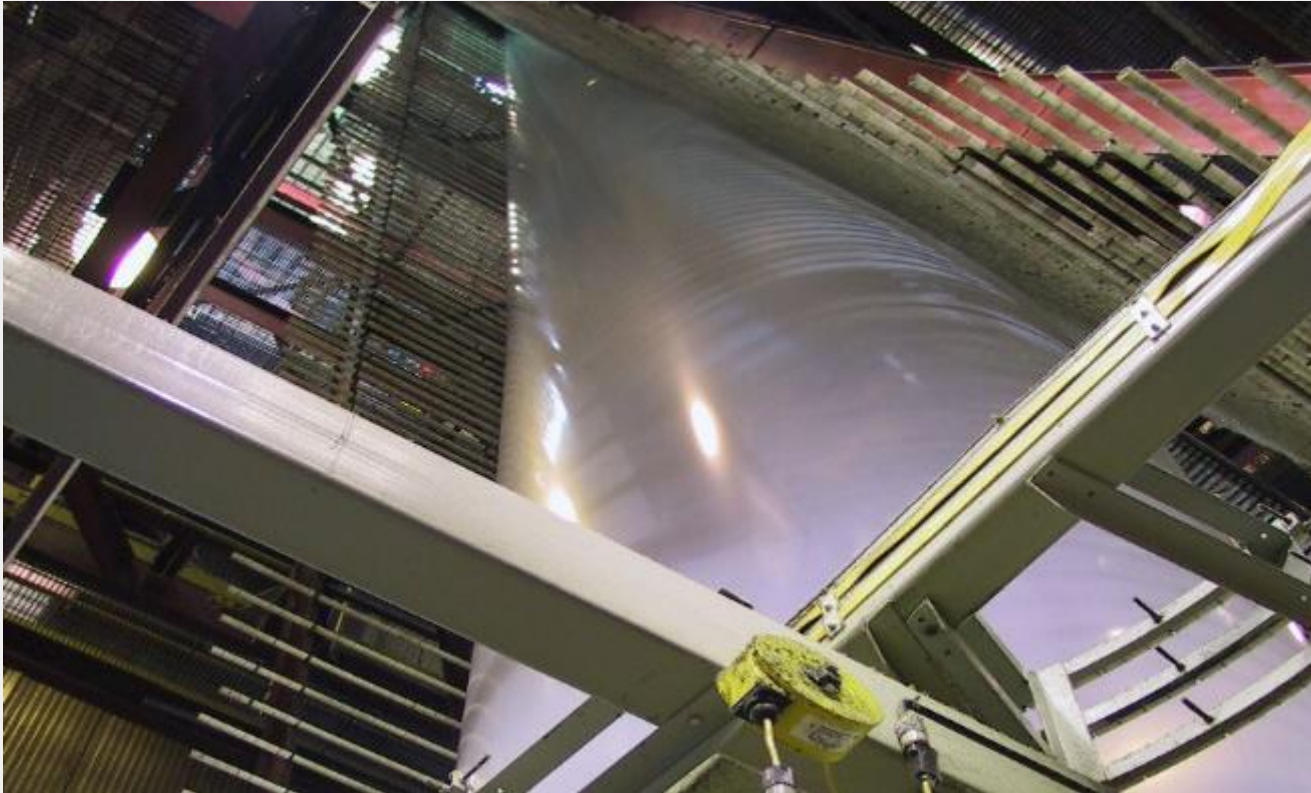
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After Use – Ag Films Need to Be Disposed Of

Farms struggle with appropriate disposal of Ag Films

- Some farms burn the plastic – poor solution
- Some farms bury the plastic – poor solution
- Some farms take the plastic to the landfill – bulky material that fills the landfill – poor solution



After Use – Ag Films Recycling a Viable Solution

Challenges with Recycling Ag Films

- Films must be segregated – polyethylene only, no bale twine or netting
- Has to be transported to a collection site efficiently
- Has to be compacted to fill a shipping container – cannot be loose, not viable to ship “air”
- Shipping containers have to ship as directly as possible to the recycled polymer facility to minimize freight and handling costs
- Price paid for recycled ag films does not cover full cost of handling and shipping to the recycling facility
- User fees / non-refundable deposits paid at the time of purchase are necessary to offset the facilitation of a recycling program
- In Canada, grain bags are supplied to the market from at least 9 different countries – collection of deposit must be the responsibility of the “first seller” – importer, distributor, or else the offshore bags will be under the radar and won’t be captured in the deposit collection.

After Use – Ag Films Recycling a Viable Solution

How Grain Bags are Typically Collected

- When grain is extracted from the grain bag, most extractors will roll the bag material into a tight bag 'bale'
- The bag bales can be easily handled and dropped off at conveniently located collection sites (often the same sites as pesticide containers are dropped off)
- Bags are then loaded into shipping containers / trucks and hauled to recycling facilities



After Use – Ag Films Recycling a Viable Solution

Recycled Ag Films Are Given a Second Life as Useful Products

- Garbage Bags
- Plastic “lumber”
- Industrial sheeting, drip lines, among other useful products



RPC BPI Recycled Products – Closing the Loop

A Sister Company to RPC BPI Agriculture is BPI Recycled Products – A Potential Consumer of Alberta’s Recycled Ag Films

- At BPI Recycled Products, Packaging, Farm, and Industrial Films are collected, cleaned, and processed into recycled polymers and are then in turn manufactured into industrial grade films such as “plastic wood”, industrial membrane films, and garbage bags.
- We have already shipped containers of grain bags from Saskatchewan to the UK to process in our Recycled Products facilities with great success.



Questions?

Thank you.