

## Application Recommendations for PSA Coating with Argotec™ Protective Films

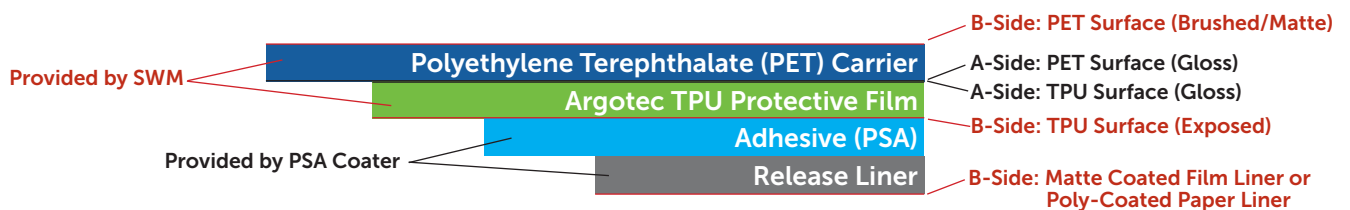


Argotec™ Thermoplastic Polyurethane (TPU) Paint and Surface Protection Films offer SWM customers many valuable features and corresponding benefits to their end-use applications. Key features include, but are not limited to, optical clarity, a high gloss surface, high and low temperature flexibility, and excellent conformability to three-dimensional surfaces.

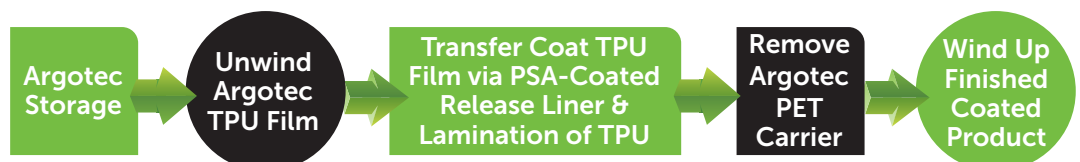
The optical and gloss features of these highly flexible films can, however, be compromised in downstream coating and handling processes. Temperature, pressure, wind tension and contact with other surfaces can all negatively impact these important characteristics. The purpose of this bulletin is to provide Pressure Sensitive Adhesive (PSA) coaters valuable tips on handling and processing Argotec TPU paint & surface protection films, and to offer guidelines for selecting adhesives and release liners.

The tips and guidelines contained herein are primarily aimed at increasing Argotec yield in the PSA coating process.

### Typical Argotec Protective Film Cross Section



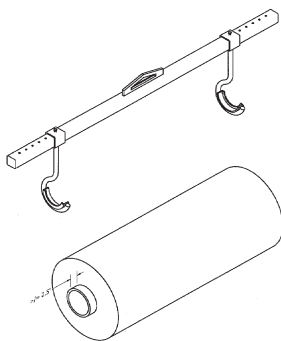
### Typical PSA Coating Process



# Application Bulletin

## Storage & Handling

- Store in a temperature-controlled environment.
- SWM highly recommends lifting/handling TPU roll goods and converted TPU roll goods with suspension packaging utilizing J-hooks (shown below).
- Roll handling is critical to downstream quality performance. In roll form, compression forces result in exaggerated de-air and distortion of the urethane film's surfaces, as well as a transfer of the "B-side" Polyethylene Terephthalate (PET) surface to the "A-side" surface of the TPU film (sometimes referred to in the industry as "roll set").
- Do not lay roll on flat surface as film bruises easily resulting in dark dents or lines within the roll's surface.
- Do not handle or transport the roll by applying force to the roll's outer surface (again, film bruises easily).
- Use recommended J-hook lifting device and roll cannons to transport rolls (lifting via core ends).
- **For best yield and material utilization it is recommended that the Argotec TPU film be PSA coated within four weeks of receipt/delivery.**



## Film Unwind

- The exposed B-side of the Argotec film comes in contact with the scratched (brushed/matte) B-side of the PET carrier while in roll form.
- Expect scratch lines to transfer to the exposed urethane film surface. These scratch lines are a typical characteristic of this product and downstream processes (adhesive coating, treating, etc.) should take this into consideration. The scratch lines allow the urethane film to be unwound without blocking.
- Web heating of the Argotec film's B-side to prepare its urethane surface prior to PSA coating will promote adhesive flow and anchorage to the TPU film surface at film unwind during PSA application.

## Transfer Coating & Release Liner

- Adhesive coat weight and rheology should be designed/tailored to adequately flow/wet-out transfer scratch lines of the B-side of film.
- Film Liner:
  - Matte coated (backside) release liners will impart their matte finish onto the A-side TPU surface while in roll form if Argotec-supplied PET carrier has been removed. This B-side surface of the release liner is critical; too glossy a finish will create laking effect on the gloss A-side
  - TPU surface and/or blocking during unwind of PSA coated film; too heavy a matte finish will transfer a dull matte image to the TPU gloss A-side creating dull blotchy areas.
  - Hand winding or back winding to reduce winding tension on the finished product is recommended.
- Paper Liner:
  - See above film liner comments regarding backside of a liner finish.
  - Poly-coated backside liners provide adequate finish to unwind without blocking yet minimize mottling of A-side of TPU film.
- Typically 1" - 4" (2.54 - 10.2 cm) dark bands areas exist in the circumference of each master roll; these are called gauge bands in the extrusion industry and are inherent in cast extrusion. With proper PSA coating weight, nip pressure and PSA rheology, this band phenomenon can be properly "coated out."

## PET Carrier Removal & Finished Product Windup

- Use > 120° peel angle to remove the PET carrier.
- Once the PET carrier is removed, the B-side (backside) of release liner must be cleaned to help aid the A-side TPU film from forming dimples, pits or dents.
- Care should be taken to optimize/limit finished PSA coated master roll length put-ups in order to minimize film mottling (roll set) while stored in roll form.
- Hand winding or back winding to reduce tension on the finished product is recommended.

AMSARG\_APPPSA  
112020

**Advanced  
Materials  
& Structures**

ams@swmintl.com  
swmintl.com

**For more information on Argotec Films email us at [ams@swmintl.com](mailto:ams@swmintl.com) or visit [swmintl.com](http://swmintl.com).**

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