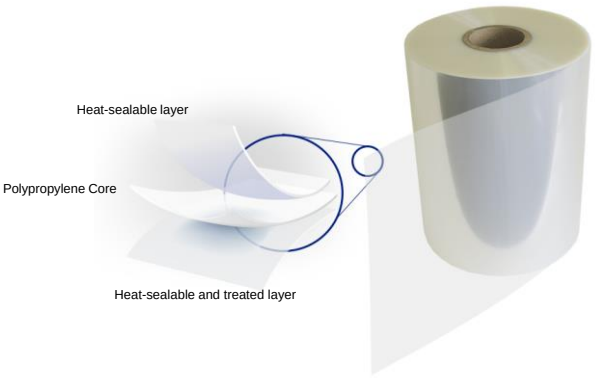
TSY.3RS

POLO SEAL

Transparent BOPP film
Heat-sealable
Surface treatment for printing and/or lamination
Made of industrial recycling resin (Food Grade)

Main Characteristics

- Both sides heat-sealable, non-treated side from 105°C;
- Surface treatment on inner or outer layer;
- Good optical properties (gloss and transparency);
- Optimum performance in horizontal and vertical form-fill-seal packing machines.



Typical Applications

- Flexible packaging for food: cookies, snacks, chocolate bars, cereal bars and packaging for printed grouping;
- Non-food flexible packaging: monolayers or laminate;
- Continuous labels (WAL Roll Fed), monolayers or laminate;
- Developed for HFFS - Horizontal Form Fill Seal and VFFS - Vertical Form Fill Seal filling processes.

Properties		Methodology	Unit	Range	17TSY3RS	20TSY3RS	25TSY3RS	30TSY3RS	35TSY3RS	40TSY3RS	50TSY3RS
Physical Properties											
Nominal Thickness		DIN 53370	µm	**Target**	**17.0**	**20.0**	**25.0**	**30.0**	**35.0**	**40.0**	**50.0**
				Min.	16.2	19.0	23.8	28.5	33.3	38.0	47.5
				Max.	17.9	21.0	26.3	31.5	36.8	42.0	52.5
			Gauge	**Target**	**66.9**	**78.7**	**98.4**	**118.1**	**137.8**	**157.5**	**196.9**
				Min.	63.6	74.8	93.5	112.2	130.9	149.6	187.0
				Max.	70.3	82.7	103.3	124.0	144.7	165.4	206.7
Unit Weight		ASTM D 4321	g/m²	**Target**	**15.4**	**18.1**	**22.6**	**27.2**	**31.7**	**36.2**	**45.3**
				Min.	14.6	17.2	21.5	25.8	30.1	34.4	43.0
				Max.	16.2	19.0	23.8	28.5	33.3	38.0	47.5
			lb/ream	**Target**	**9.5**	**11.1**	**13.9**	**16.7**	**19.5**	**22.2**	**27.8**
				Min.	9.0	10.6	13.2	15.8	18.5	21.1	26.4
				Max.	9.9	11.7	14.6	17.5	20.4	23.4	29.2
Yield		ASTM D 4321	m²/kg	**Target**	**65.0**	**55.2**	**44.2**	**36.8**	**31.6**	**27.6**	**22.1**
				Min.	61.9	52.6	42.1	35.1	30.1	26.3	21.0
				Max.	68.4	58.2	46.5	38.8	33.2	29.1	23.3
			in²/lb	**Target**	**45698**	**38844**	**31075**	**25896**	**22196**	**19422**	**15537**
				Min.	43522	36994	29595	24663	21139	18497	14798
				Max.	48104	40888	32710	27259	23365	20444	16355
Surface Treatment	T	ASTM D 2578	dinas/cm	**Target**				**42**			
				Min.				38			
Coefficient of Friction	NT	ASTM D 1894	-	**Target**				**0.25**			
				Min.				0.15			
				Max.				0.35			
Optical Properties											
Haze		ASTM D 1003	%	**Target**	**1.6**	**1.7**	**1.8**	**2.0**	**2.2**	**2.4**	**2.6**
				Max.				4.0			
Gloss (45°)		ASTM D 2457	u.b.	**Target**	**93**	**91**	**91**	**90**	**90**	**90**	**90**
				Min.				80			
Mechanical Properties											
Tensile Strenght	MD	ASTM D 882	N/mm²	**Target**				**140**			
	TD							**240**			
	MD		lbf/in²	**Target**				**20305**			
	TD							**34809**			
Elongation at Break	MD	ASTM D 882	%	**Target**	**180**	**200**	**200**	**220**	**220**	**220**	**220**
	TD				**40**	**40**	**50**	**60**	**60**	**60**	**60**
Shrinkage	MD	ASTM D 1204		**Target**				**3**			
	TD							**1**			
Sealing Range	NT	ASTM F 88	°C	**Target**				**105 - 130**			
			°F	**Target**				**221 - 266**			
Sealing Strenght	NT	ASTM F 88	g/25mm or gf/in	**Target**	**400**	**450**	**500**	**550**	**600**	**650**	**800**
				Min.				300			
Barrier Properties											
TPVA | 38°C / 90%UR		ASTM F 1249	g H_2O / (m².dia)	**Target**	**≤ 9.5**	**≤ 9.0**	**≤ 8.5**	**≤ 8.0**	**≤ 7.5**	**≤ 7.0**	**≤ 6.5**
WVTR | 100°F / 90%RH		ASTM F 1249	g H_2O / (100in².day)	**Target**	**≤ 0.61**	**≤ 0.58**	**≤ 0.55**	**≤ 0.51**	**≤ 0.48**	**≤ 0.45**	**≤ 0.42**
TPO_2 | 23°C / 0%UR		ASTM D 3985	cm³ O_2 / (m².dia)	**Target**	**≤ 3500**	**≤ 3200**	**≤ 2550**	**≤ 2100**	**≤ 1800**	**≤ 1600**	**≤ 1300**
OTR | 73°F / 0%RH		ASTM D 3985	cm³ O_2 / (100in².day)	**Target**	**≤ 225**	**≤ 206**	**≤ 164**	**≤ 135**	**≤ 116**	**≤ 103**	**≤ 84**

1. Acronyms:
MD: Machine Direction | TD: Transverse Direction;
NT: Non Treated Layer | T: Treated Layer;
WAL: Wrap Around Label.

2. Additional:
The restrained information in this datasheet represent typical data, and does not constitute genuine warranty liability as far as the product process and or application. In case of doubts or development of other thicknesses or applications, consult your dealer or send e-mail to: contato@polofilms.com.br.

Review: 00/2020

TSY.3RS

POLO SEAL

Transparent BOPP film
Heat-sealable
Surface treatment for printing and/or lamination
Made of industrial recycling resin (Food Grade)

Food Contact Regulations

SEAL Family films comply with Mercosul, ANVISA, FDA (Food and Drug Administration) and the European Community legislations for applications involving direct contact with food. Full details are provided in the Declaration of Conformity. Customers intending to use SEAL Family films for applications intended to come into contact with food should request a copy of that document from POLO Films.
The MSDS (Material Safety Data Sheet), as well as the evaluation of conformity for contact with food from other legislations are also available upon request. Contact your dealer for any questions.

Storage and Transportation Terms & Conditions

All products are stored and transported in dry, covered and clean environments.
It is recommended that storage and transportation take place at temperature around 30°C and 60% relative humidity.

If the temperature and humidity are not as recommended, the following issues may occur:
- Decreased level of surface treatment, leading to printing and/or lamination difficulties;
- Decreased film transparency;
- Too low CoF, making processing and machinability difficult.

BOPP films are recommended to be kept at operating room temperature for 24 hours before use.

Dimensional Specifications / Product Validity

Width	**Minimum:** 0 mm | **Maximum:** 2 mm (from standard width)
Outer Diameter*	**Minimum:** 30 mm | **Maximum:** 20 mm (from standard diameter)
Core	**Minimum:** 1 mm | **Maximum:** 1 mm (from standard diameter)
Splices per roll	**Maximum:** 2
% of Splices per order	**Maximum:** 30%
Shelf Life (after production)	6 months

* For other dimensional information, consult your dealer.

Polo Films Nomenclature

Unit Weight or Thickness	Technology	Main Feature	Specialty	Sealing	Treatment
20	T	SY	3RS	3	2

Unit Weight/ Thickness

Expressed in g/m². Used for white/opaque films;
Expressed in µm. Used for transparent, matte and metallized films.

Technology

T - Tenter | C - Cast.

Main Feature

SY - Transparent heat-sealable for printing and/or lamination.

Specialty

3RS - Production with industrial reprocessing material (Reduce, Reuse, Recycle).

Sealing

0 - Not Sealable;
1 - Sealing on the Inner Face;
2 - Sealing on the Outer Face;
3 - Sealing on both Sides.

Treatment

0 - No Treatment;
1 - Treatment on Inner Face;
2 - Treatment on Outer Face;
3 - Treatment on both Sides.