JBF – PET FILMS

Overview of Specialty Films

Sustainable Range

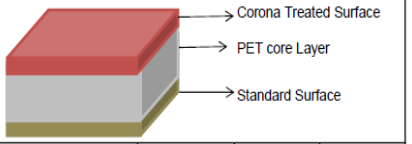
PCR PET Films

- JBF has PCR films available with PCR content from 25% till 90%.
- These films are available in grades like Clear, Matte, White, Metallised etc. & in thickness from 48 ga till 10 mil .
- These films are Certified with ISO14021:2016 . ISCC , GRS and RCS

Technical Data Sheet

ARYAFILM - P410

ARYAFILM P410 is one- side corona treated polyester film produced with up to 90% Post consumer recycle content, this film is suitable for metalizing, printing & lamination and has good wettability & excellent machinability.



Sr. No.	Properties		Unit	Test Method	Target	Minimum	Maximum
General							
1	Thickness		Micron	JBF Method	12.0	11.64	12.36
			Gauge		48.00	46.56	49.44
2	Yield		M^2/Kg	JBF Method	59.52	57.79	61.36
3	Density		gm/cc	ASTM D 1505	1.395		
4	Roll width		mm	JBF Method	`- 0 , + 3		
Mechanical							
1	Tensile Strength at break	MD/TD	Kg/cm^2	ASTM D 882	2000	1800	2200
			(Kpsi)		28.4	25.6	31.3
2	Elongation at break	MD	%	ASTM D 882	130	90	170
		TD			120	80	160
3	Co-efficient of friction (One to Other side)	Static	--	ASTM D 1894	0.45	0.35	0.55
		Dynamic			0.40	0.30	0.50
Thermal							
1	Shrinkage @ 150^0 C/30'	MD	%	ASTM D 1204	1.6	1.2	2.0
		TD			0.4	0.0	0.8
2	Melting Point		^{0}C	DSC	252	250	255
Optical							
1	Haze		%	ASTM D 1003	3.5	2.5	4.5
2	Transmittance		%	ASTM D 1003	88.0	85.0	91.0
Surface treatment level							
1	Plain Side		Dyne/cm	ASTM D 2578	44	42	46
Barrier							
1	W.V.T.R. (38°C & 90% RH)		$gm/m^2/day$	ASTM F 1249	40	30	50
			$gm/100in^2/day$		2.58	1.94	3.23
2	O.T.R. (23°C & 0%RH)		$cc/m^2/day$	ASTM D 3985	100	80	120
			$cc/100in^2/day$		6.45	5.16	7.74

COTECNA

ISCC PLUS Certificate

Certificate Number: ISCC-PLUS- Cert- IN201-20231135

Cotecna Inspection India Pvt Ltd
1, Lee Road (3rd Floor), Kolkata – 700020, India

certifies that

JBF BAHRAIN W.L.L,
Building No. 461, Road no. 1508, Block No. 115, Hidd, Manama-50397, Bahrain

complies with the requirements of the certification system
ISCC PLUS
(International Sustainability and Carbon Certification)

Place of the audit
(if different from the legal address of the system user as stated above; only applicable for traders and traders with storage):
Address of the Audit / n.a.

This certificate is valid from 03.11.2023 to 02.11.2024.

The site of the system user is certified as:
Processing Unit
(Extrusion, Metallizing and Coating)

The scope of the certificate includes the following chain of custody options:
(not applicable for paper traders)
Mass balance

Kolkata, 01.11.2023
Place and date of issue

Stamp, Signature of issuing party

The issuing Certification Body is responsible for the accuracy of this document.
Version / Date: 1 (no adjustments) / 01.11.2023

HS PET FILMS

HS PET films are available in thickness 48 ga till 200 ga with Seal strength range from 400 gms to 1400 gms.

These films can be used to make Mono-material Laminate in 2 and 3 ply structures.

- Currently films are available in 2 variants

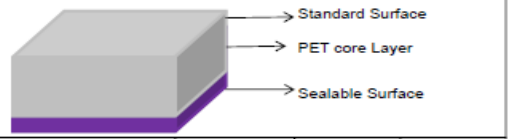
Normal Seal Strength – A500 / A510

High Seal Strength - A550 / A551

Technical Data Sheet
ARYAFILM - A500

ARYAFILM

ARYAFILM A500 is co extruded one side heat sealable film, Heat sealable layer is designed to heat seal to itself or APET, CPET, PVC etc suitable for flexible packaging & dual oven able.



Sr. No.	Properties		Unit	Test Method	Target	Minimum	Maximum
General							
1	Thickness		Micron	JBF Method	12.0	11.64	12.36
			Gauge		48.00	46.56	49.44
2	Yield		M^2/Kg	JBF Method	59.52	57.79	61.36
3	Density		gm/cc	ASTM D 1505		1.395	
4	Roll width		mm	JBF Method		`- 0 , + 3	
Mechanical							
1	Tensile Strength at break	MD/TD	Kg/cm^2	ASTM D 882	1900	1700	2100
			(Kpsi)		27.0	24.2	29.9
2	Elongation at break	MD	%	ASTM D 882	130	90	170
		TD			120	80	160
3	Co-efficient of friction (One to Other side)	Static	--	ASTM D 1894	0.50	0.40	0.60
		Dynamic			0.45	0.35	0.55
4	Heat Seal Strength (Seal to Seal) @120°C/2 Sec 30 N		gm/25mm	JBF Method	350	250	550
Thermal							
1	Shrinkage @ 150°C/30'	MD	%	ASTM D 1204	1.8	1.2	2.4
		TD			0.4	0.0	0.8
2	Melting Point		°C	DSC	252	250	255
Optical							
1	Haze		%	ASTM D 1003	3.5	2.5	4.5
2	Transmittance		%	ASTM D 1003	88.0	85.0	91.0
Surface treatment level							
1	Plain side		Dyne/cm	ASTM D 2578	44	42	46
2	Sealable side		Dyne/cm	ASTM D 2578	46	44	48
Barrier							
1	W.V.T.R. (38°C & 90% RH)		$gm/m^2/day$	ASTM F 1249	40	30	50
			$gm/100in^2/day$		2.58	1.94	3.23
2	O.T.R. (23°C & 0%RH)		$cc/m^2/day$	ASTM D 3985	100	80	120
			$cc/100in^2/day$		6.45	5.16	7.74

Antimony free

Why Antimony used in BOPET FILM

The BOPET film manufactured from PET chips, during the polymerization of PET chips commonly antimony is used as a catalyst (antimony acetate or antimony trioxide). However, the toxicity of antimony compounds can cause adverse effects on human health and environment if the SML is more than 40ppb.

In recent years, some new requirements have been put forward in the world on the use of antimony free.

Advantages of Antimony free polyester film

- The permissible migration of Antimony in foodstuff 0.04 mg/kg as per EU regulation 10/2011, because of the low acceptance limit of antimony migration some of the customers prefer to use antimony free film . The specific migration testing antimony is essential for conventional PET films, especially for food packaging where in PET is heated along with the food.
- No need for antimony migration testing of packaging or food
- The PET film is antimony free; hence, no Antimony can transfer to food items.
- Contribution to protect the environment

- **Features of Antimony ARYAFILM**
- Available in thickness from 10 to 250 micron.
- No need to test the film SML of antimony in food simulants.
- The antimony cannot transferred in the food.
- A valuable contribution to environment
- Excellent mechanical properties (Like tensile strength) to meet the high tension required in printing / coating process.
- 6) Excellent weather resistance.
- 7) One side corona treatment, different type of chemical coated as per customer requirements
- **Application of Antimony Free film**
- Lidding film for dairy product (Isotropic film)
- Direct contact lids
- Flexible Packaging (mostly food packaging in hot condition)
- Cooking and roasting bag
- Peel able sealable films for food tray sealing .
- **Antimony Free ARYAFILM product**
- S410 – One side corona treated film
- S420 – One side chemical coated film
- S431- One side acrylic coated film
- S499 – Isotropic film for lidding application (Corona and chemical coated as per customer requirement)

Clean & Clear Range

Largest Clean Room for 8.5 mtrs wide PET Film

Video Link https://youtu.be/uIu5EfehQ-I

JBF Bahrain has most advance and widest clean room for PET film. This line can produce 8.5 mtr wide film rolls in thickness from 32 ga till 200 ga.

Super Clear Films

Super Clear thin films produced in clean room environment are suitable for special flexible packaging, Electronics , Pharma packaging which require dust free films. These films meet high standards of clean room processing like Window Film or Electronic product manufacturing.

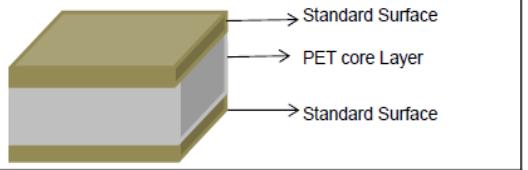
A100 series clean room films are available from 40 ga onwards.

Technical Data Sheet

ARYAFILM - A100

ARYAFILM

ARYAFILM A100 is Both side Plain super clear Polyester film specially for reprographics, packaging, labels, photosensitive coating applications.



Sr. No.	Properties		Unit	Test Method	Target	Minimum	Maximum
General							
1	Thickness		Micron	JBF Method	50.0	49.00	51.00
			Gauge		200.00	196.00	204.00
2	Yield		M^2/Kg	JBF Method	14.29	14.01	14.58
3	Density		gm/cc	ASTM D 1505	1.395		
4	Roll width		mm	JBF Method	`- 0 , + 3		
Mechanical							
1	Tensile Strength at break	MD/TD	Kg/cm^2	ASTM D 882	1900	1700	2100
			(Kpsi)		27.0	24.2	29.9
2	Elongation at break	MD	%	ASTM D 882	140	100	180
		TD			130	90	170
3	Co-efficient of friction (One to Other side)	Static	--	ASTM D 1894	0.40	0.30	0.50
		Dynamic			0.35	0.25	0.45
Thermal							
1	Shrinkage @ 150^0 C/30'	MD	%	ASTM D 1204	1.4	1.0	1.8
		TD			0.4	0.0	0.8
2	Melting Point		^{0}C	DSC	252	250	255
Optical							
1	Haze		%	ASTM D 1003	1.1	0.7	1.5
2	Transmittance		%	ASTM D 1003	90.0	88.0	92.0
Surface treatment level							
1	Both side		Dyne/cm	ASTM D 2578	44	42	46

High Performance Range

Isotropic Film

Isotropic films are suitable for lidding application for dairy products like – Yogurt cups and ice-cream lids.

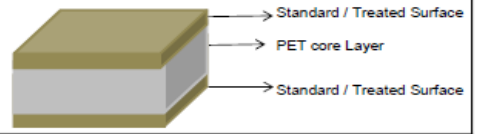
Isotropic PET film has desirable features such as superior thermal stability, crack resistance, gloss and medium barrier.

A499 grade film is available in thickness from 48 ga till 200 ga.

Technical Data Sheet
ARYAFILM - A499

ARYAFILM

ARYAFILM A499 is bi-axially oriented isotropic transparent polyester film ,this film is Suitable for lidding application for dairy products. (Coating or corona as per requirement)



Sr. No.	Properties		Unit	Test Method	Target	Minimum	Maximum
General							
1	Thickness		Micron	JBF Method	12.0	11.64	12.36
			Gauge		48.00	46.56	49.44
2	Yield		M^2/Kg	JBF Method	59.52	57.79	61.36
3	Density		gm/cc	ASTM D 1505	1.395		
4	Roll width		mm	JBF Method	`- 0 , + 3		
Mechanical							
1	Tensile Strength at break	MD/TD	Kg/cm^2	ASTM D 882	2000	1800	2200
			(Kpsi)		28.4	25.6	31.3
2	Elongation at break	MD	%	ASTM D 882	130	90	170
		TD			120	80	160
3	Co-efficient of friction (One to Other side)	Static	--	ASTM D 1894	0.45	0.35	0.55
		Dynamic			0.40	0.30	0.50
4	Ratio of Tensile Strength(+45°/-45°)		--	JBF Method	1.0	0.66	1.5
5	Ratio of Elongation (+45°/-45°)		--	JBF Method	1.0	0.50	2.0
Thermal							
1	Shrinkage @ 150^0 C/30'	MD	%	ASTM D 1204	1.6	1.2	2.0
		TD			0.4	0.0	0.8
2	Melting Point		°C	DSC	252	250	255
Optical							
1	Haze		%	ASTM D 1003	3.5	2.5	4.5
2	Transmittance		%	ASTM D 1003	88.0	85.0	91.0
Surface treatment level							
1	Both side		Dyne/cm	ASTM D 2578	44	42	46
Barrier							
1	W.V.T.R. (38°C & 90% RH)		gm/m^2/day	ASTM F 1249	40	30	50
			$gm/100in^2$/day		2.58	1.94	3.23
2	O.T.R. (23°C & 0%RH)		cc/m^2/day	ASTM D 3985	100	80	120
			$cc/100in^2$/day		6.45	5.16	7.74

High Dyne Film

A403 High Dyne Films are suitable for various industrial applications like TCA coating or

Abrasive coatings.

High Dyne saves time and cost as there is no need of additional coating or priming which is done during TCA or abrasive coating process.

Film is available in various thickness from 48 ga till 10 mil.

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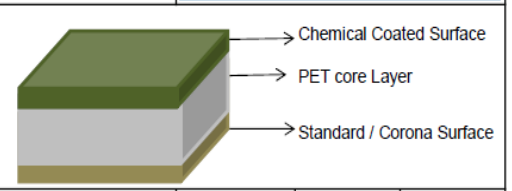
Technical Data Sheet

ARYAFILM - A403

ARYAFILM

ARYAFILM A403 is One side Chemical coated other side plain (option for corona treated) transparent polyester film , this film is suitable for PU resins/inks.



Sr. No.	Properties		Unit	Test Method	Target	Minimum	Maximum
General							
1	Thickness		Micron	JBF Method	50.0	49.00	51.00
			Gauge		200.00	196.00	204.00
2	Yield		M^2/Kg	JBF Method	14.29	14.01	14.58
3	Density		gm/cc	ASTM D 1505	1.395		
4	Roll width		mm	JBF Method	`- 0 , + 3		
Mechanical							
1	Tensile Strength at break	MD/TD	Kg/cm^2	ASTM D 882	1900	1700	2100
			(Kpsi)		27.0	24.2	29.9
2	Elongation at break	MD	%	ASTM D 882	140	100	180
		TD			130	90	170
3	Co-efficient of friction (One to Other side)	Static	--	ASTM D 1894	0.40	0.30	0.50
		Dynamic			0.35	0.25	0.45
Thermal							
1	Shrinkage @ 150^0 C/30'	MD	%	ASTM D 1204	1.4	1.0	1.8
		TD			0.4	0.0	0.8
2	Melting Point		^0C	DSC	252	250	255
Optical							
1	Haze		%	ASTM D 1003	7.0	5.0	9.0
2	Transmittance		%	ASTM D 1003	88.0	85.0	91.0
Surface treatment level							
1	Chemical Coated Side		Dyne/cm	ASTM D 2578	66	64	68
2	Plain Side		Dyne/cm	ASTM D 2578	44	42	46

DIRECT EMBOSSABLE

A503 is Direct Embossable film and is suitable for Holographic application.

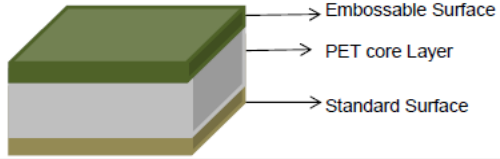
Film is available in various thickness from 48 ga onwards.

Available in PET A503 and Met PET AM503 variants.

Technical Data Sheet

ARYAFILM - A503

ARYAFILM A503 is co-extruded transparent polyester film having one side direct embossable layer,this film is suitable for direct embossing without any offline coating and providing deep & sharp impression.



Sr. No.	Properties		Unit	Test Method	Target	Minimum	Maximum
General							
1	Thickness		Micron	JBF Method	13.0	12.61	13.39
			Gauge		52.00	50.44	53.56
2	Yield		M^2/Kg	JBF Method	54.95	53.34	56.64
3	Density		gm/cc	ASTM D 1505	1.395		
4	Roll width		mm	JBF Method	`- 0 , + 3		
Mechanical							
1	Tensile Strength at break	MD/TD	Kg/cm^2	ASTM D 882	2100	1900	2300
			(Kpsi)		29.9	27.0	32.7
2	Elongation at break	MD	%	ASTM D 882	130	90	170
		TD			120	80	160
3	Co-efficient of friction (One to Other side)	Static	--	ASTM D 1894	0.50	0.40	0.60
		Dynamic			0.45	0.35	0.55
Thermal							
1	Shrinkage @ 150^0 C/30'	MD	%	ASTM D 1204	1.8	1.2	2.4
		TD			0.4	0.0	0.8
2	Melting Point		^0C	DSC	252	250	255
Optical							
1	Haze		%	ASTM D 1003	2.5	1.5	3.5
2	Transmittance		%	ASTM D 1003	88.0	85.0	91.0
Surface treatment level							
1	Embossable side		Dyne/cm	ASTM D 2578	40	38	42
2	Plain side		Dyne/cm	ASTM D 2578	44	42	46

Hot Stamping Foil

A206, is very popular and fast moving PET film grade and is suitable for Hot Stamping Foil application.

Film has very good optical property and very good shrinkage .

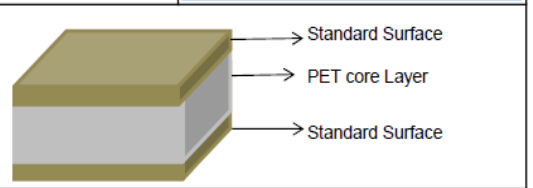
Currently approved at many large customers globally.

It is possible to produce rolls of 2550mm or 100” wide.

Technical Data Sheet

ARYAFILM - A206

ARYAFILM A206 is optically clear Polyester film suitable for Hot Stamping Foil application.



Sr. No.	Properties		Unit	Test Method	Target	Minimum	Maximum
General							
1	Thickness		Micron	JBF Method	12.0	11.64	12.36
			Gauge		48.00	46.56	49.44
2	Yield		M^2/Kg	JBF Method	59.52	57.79	61.36
3	Density		gm/cc	ASTM D 1505	1.395		
4	Roll width		mm	JBF Method	`- 0 , + 3		
Mechanical							
1	Tensile Strength at break	MD/TD	Kg/cm^2	ASTM D 882	2000	1800	2200
			(Kpsi)		28.4	25.6	31.3
2	Elongation at break	MD	%	ASTM D 882	130	90	170
		TD			120	80	160
3	Co-efficient of friction (One to Other side)	Static	--	ASTM D 1894	0.45	0.35	0.55
		Dynamic			0.40	0.30	0.50
Thermal							
1	Shrinkage @ 190^0 C/20′	MD	%	ASTM D 1204	3.2	2.8	3.6
		TD			-0.2	-0.6	0.2
2	Melting Point		^0C	DSC	252	250	255
Optical							
1	Haze		%	ASTM D 1003	2.0	1.5	2.5
2	Transmittance		%	ASTM D 1003	89.0	86.0	92.0
Surface treatment level							
1	Both side		Dyne/cm	ASTM D 2578	44	42	46

High Friction Film

A438, High Friction PET films are used for making PET food, Fertilisers etc. heavy bags which are stacked in retail stores.

A438 has excellent property of high friction which helps in high stacking and avoid slippage resulting in product damage or accidents in retail outlets.

These films are available in thickness of 48 ga and above.

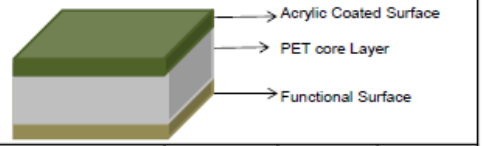
JBF BAHRAIN

Technical Data Sheet

ARYAFILM - A438

ARYAFILM

ARYAFILM A438 is one side high coefficient of friction other side acrylic coated polyester film.this film is suitable for printing, lamination, and big bulk packaging.



Sr. No.	Properties		Unit	Test Method	Target	Minimum	Maximum
General							
1	Thickness		Micron	JBF Method	12.0	11.64	12.36
			Gauge		48.00	46.56	49.44
2	Yield		M^2/Kg	JBF Method	59.52	57.79	61.36
3	Density		gm/cc	ASTM D 1505	1.395		
4	Roll width		mm	JBF Method	`- 0 , + 3		
Mechanical							
1	Tensile Strength at break	MD/TD	Kg/cm^2	ASTM D 882	2000	1800	2200
			(Kpsi)		28.4	25.6	31.3
2	Elongation at break	MD	%	ASTM D 882	130	90	170
		TD			120	80	160
3	Co-efficient of friction (Functional to Functional)	Static	--	ASTM D 1894	1.00	0.80	Block
		Dynamic			1.00	0.80	Block
Thermal							
1	Shrinkage @ 150^0 C/30'	MD	%	ASTM D 1204	1.6	1.2	2.0
		TD			0.4	0.0	0.8
2	Melting Point		^{0}C	DSC	252	250	255
Optical							
1	Haze		%	ASTM D 1003	3.0	2.0	4.0
2	Transmittance		%	ASTM D 1003	88.0	85.0	91.0
Surface treatment level							
1	Acrylic coated side		Dyne/cm	ASTM D 2578	40	38	42
2	Functional side		Dyne/cm	ASTM D 2578	44	42	46
Barrier							
1	W.V.T.R. (38°C & 90% RH)		gm/m^2/day	ASTM F 1249	40	30	50
			$gm/100in^2$/day		2.58	1.94	3.23
2	O.T.R. (23°C & 0%RH)		cc/m^2/day	ASTM D 3985	100	80	120
			$cc/100in^2$/day		6.45	5.16	7.74

Balance Shrinkage -Thermal Lamination Base

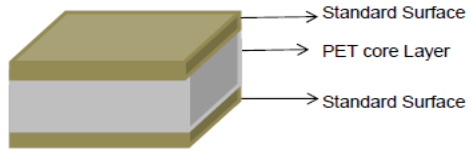
A450/A451 are films with balance shrinkage and used for making Thermal Lamination films.

These films are available with corona and plain treatment options from 40 ga till 10 mil.

Thermal lamination films made are finally used in book lamination, map and match etc. applications.

JBF BAHRAIN — **Technical Data Sheet** — **ARYAFILM - A450** — **ARYAFILM**

ARYAFILM A450 is both side plain polyester film , this film is suitable for thermal lamination due to its controlled thermal properties in transverse direction.



Sr. No.	Properties		Unit	Test Method	Target	Minimum	Maximum
General							
1	Thickness		Micron	JBF Method	12.0	11.64	12.36
			Gauge		48.00	46.56	49.44
2	Yield		M^2/Kg	JBF Method	59.52	57.79	61.36
3	Density		gm/cc	ASTM D 1505	1.395		
4	Roll width		mm	JBF Method	`- 0 , + 3		
Mechanical							
1	Tensile Strength at break	MD/TD	Kg/cm^2	ASTM D 882	2000	1800	2200
			(Kpsi)		28.4	25.6	31.3
2	Elongation at break	MD	%	ASTM D 882	130	90	170
		TD			120	80	160
3	Co-efficient of friction (One to Other side)	Static	--	ASTM D 1894	0.45	0.35	0.55
		Dynamic			0.40	0.30	0.50
Thermal							
1	Shrinkage @ 150^0 C/30'	MD	%	ASTM D 1204	2.0	1.4	2.6
		TD			1.8	1.2	2.4
2	Melting Point		^0C	DSC	252	250	255
Optical							
1	Haze		%	ASTM D 1003	3.5	2.5	4.5
2	Transmittance		%	ASTM D 1003	88.0	85.0	91.0
Surface treatment level							
1	Both side		Dyne/cm	ASTM D 2578	44	42	46
Barrier							
1	W.V.T.R. (38°C & 90% RH)		$gm/m^2/day$	ASTM F 1249	40	30	50
			$gm/100in^2/day$		2.58	1.94	3.23
2	O.T.R. (23°C & 0%RH)		$cc/m^2/day$	ASTM D 3985	100	80	120
			$cc/100in^2/day$		6.45	5.16	7.74

Foldable Range

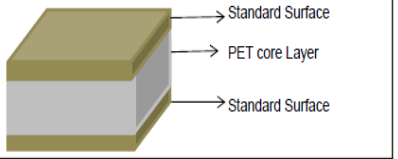
Dead Fold – Plain PET & Met PET

A443 – Clear PET and AM443 Clear Met PET are suitable for various packaging applications which require dead fold property like Candy wrapping, Gift wrapping etc.

Available with Corona ,Anti-Static etc treatment options in thickness 72 ga , 80 ga , 92 ga. Other thickness also possible.

JBF BAHRAIN — **Technical Data Sheet** — **ARYAFILM - A443** — **ARYAFILM**

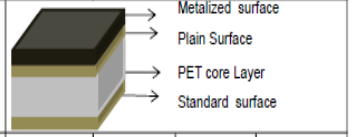
ARYAFILM A443 is both side plain fold retainable polyester film, this film is suitable for candy wrapping application.



Sr. No.	Properties		Unit	Test Method	Target	Minimum	Maximum
General							
1	Thickness		Micron	JBF Method	18.0	17.64	18.36
			Gauge		72.00	70.56	73.44
2	Yield		M^2/Kg	JBF Method	39.68	38.90	40.49
3	Density		gm/cc	ASTM D 1505	1.395		
4	Roll width		mm	JBF Method	`- 0 , + 3		
Mechanical							
1	Tensile Strength at break	MD/TD	Kg/cm^2	ASTM D 882	2200	2000	2400
			(Kpsi)		31.3	28.4	34.1
2	Elongation at break	MD	%	ASTM D 882	130	90	170
		TD			120	80	160
3	Co-efficient of friction (One to Other side)	Static	--	ASTM D 1894	0.45	0.35	0.55
		Dynamic			0.40	0.30	0.50
Thermal							
1	Shrinkage @ $150^0C/30'$	MD	%	ASTM D 1204	30.0	25.0	35.0
		TD			35.0	30.0	40.0
2	Melting Point		^0C	DSC	252	250	255
Optical							
1	Haze		%	ASTM D 1003	4.0	3.0	5.0
2	Transmittance		%	ASTM D 1003	88.0	85.0	91.0
Surface treatment level							
1	Both side		Dyne/cm	ASTM D 2578	44	42	46
Barrier							
1	W.V.T.R. (38°C & 90% RH)		$gm/m^2/day$	ASTM F 1249	28	18	38
			$gm/100in^2/day$		1.81	1.16	2.45

JBF — **Technical Data Sheet** — **ARYAFILM AM443** — **ARYAFILM**

ARYAFILM AM443 is fold retainable Metalized on plain polyester film suitable for candy wrapping applications, especially for excellent gloss & barrier properties



Sr. No.	Properties		Unit	Test Method	Target	Minimum	Maximum
General							
1	Thickness		Micron	JBF Method	18.00	17.64	18.36
			Gauge		72.00	70.56	73.44
2	Yield		M^2/Kg	JBF Method	39.68	38.90	40.49
Mechanical							
1	Tensile Strength at break	MD/TD	Kg/cm^2	ASTM D 882	2200	2000	2400
			(Kpsi)		31.3	28.4	34.1
2	Elongation at break	MD	%	ASTM D 882	130	90	170
		TD			120	80	160
3	Co-efficient of friction One side to Other side	Static	--	ASTM D 1894	0.60	0.50	0.70
		Dynamic			0.55	0.45	0.65
Thermal							
1	Shrinkage @ $150^0C/30'$	MD	%	ASTM D 1204	30.0	25.0	35.0
		TD			35.0	30.0	40.0
2	Melting Point		^0C	DSC	252	250	255
Surface treatment level							
1	Standard surface		Dynes/cm	ASTM D 2578	44	42	46

Barrier								
Optical Density (JBF Method)			M.V.T.R. (ASTM F 1249) gm/m2/day (38°C 90%RH)			O.T.R. (ASTM D 3985) cc/m2/day (23°C 0 %RH)		
Target	Minimum	Maximum	Target	Minimum	Maximum	Target	Minimum	Maximum
2.2	2.0	2.4	0.9	0.7	1.1	1.0	0.8	1.2
2.5	2.3	2.7	0.7	0.5	0.9	0.8	0.6	1.0
2.8	2.6	3.0	0.5	0.3	0.7	0.6	0.4	0.8
3.0	2.8	3.2	0.3	0.2	0.5	0.4	0.2	0.6

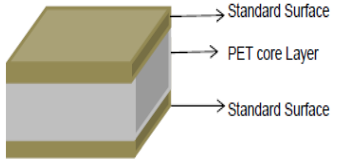
Dead Fold - White & Met White

A643 – White PET and AM643 White Met PET are suitable for various packaging applications which require dead fold property like Candy wrapping, Gift wrapping etc.

Available with Corona ,Anti-Static etc treatment options in thickness 72 ga , 80 ga , 92 ga. Other thickness also possible.

JBF BAHRAIN — **Technical Data Sheet** — **ARYAFILM - A643** — **ARYAFILM**

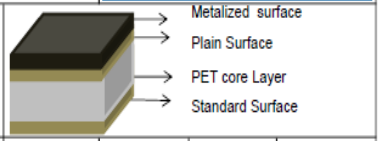
ARYAFILM A643 is milky White fold retainable polyester film ,this film is suitable for candy wrapping application.



Sr. No.	Properties		Unit	Test Method	Target	Minimum	Maximum
General							
1	Thickness		Micron	JBF Method	18.0	17.64	18.36
			Gauge		72.00	70.56	73.44
2	Yield		M^2/Kg	JBF Method	38.58	37.82	39.37
3	Density		gm/cc	ASTM D 1505	1.44		
4	Roll width		mm	JBF Method	`- 0 , + 3		
Mechanical							
1	Tensile Strength at break	MD/TD	Kg/cm^2	ASTM D 882	2200	2000	2400
			(Kpsi)		31.3	28.4	34.1
2	Elongation at break	MD	%	ASTM D 882	130	90	170
		TD			120	80	160
3	Co-efficient of friction (One to Other side)	Static	--	ASTM D 1894	0.45	0.35	0.55
		Dynamic			0.40	0.30	0.50
Thermal							
1	Shrinkage @ $150^0C/30'$	MD	%	ASTM D 1204	30.0	25.0	35.0
		TD			35.0	30.0	40.0
2	Melting Point		^0C	DSC	252	250	255
Optical							
1	Haze		%	ASTM D 1003	95.0	90.0	100.0
2	Transmittance		%	ASTM D 1003	50.0	45.0	55.0
Surface treatment level							
1	Both side		Dyne/cm	ASTM D 2578	44	42	46

JBF — **Technical Data Sheet** — **ARYAFILM AM643** — **ARYAFILM**

ARYAFILM AM643 is Metalized on plain side other side plain milky white fold retainable polyester film. This film is suitable for candy wrapping applications, especially for excellent gloss & barrier properties.



Sr. No.	Properties		Unit	Test Method	Target	Minimum	Maximum
General							
1	Thickness		Micron	JBF Method	18.00	17.64	18.36
			Gauge		72.00	70.56	73.44
2	Yield		M^2/Kg	JBF Method	38.58	37.82	39.37
Mechanical							
1	Tensile Strength at break	MD/TD	Kg/cm^2	ASTM D 882	2200	2000	2400
			(Kpsi)		31.3	28.4	34.1
2	Elongation at break	MD	%	ASTM D 882	130	90	170
		TD			120	80	160
3	Co-efficient of friction One side to Other side	Static	--	ASTM D 1894	0.60	0.50	0.70
		Dynamic			0.55	0.45	0.65
Thermal							
1	Shrinkage @ $150^0C/30'$	MD	%	ASTM D 1204	30.0	25.0	35.0
		TD			35.0	30.0	40.0
2	Melting Point		^0C	DSC	252	250	255
Surface treatment level							
1	Standard Surface		Dynes/cm	ASTM D 2578	44	42	46

Barrier								
Optical Density (JBF Method)			M.V.T.R. (ASTM F 1249) gm/m2/day (38°C 90%RH)			O.T.R. (ASTM D 3985) cc/m2/day (23°C 0 %RH)		
Target	Minimum	Maximum	Target	Minimum	Maximum	Target	Minimum	Maximum
2.2	2.0	2.4	0.9	0.7	1.1	1.0	0.8	1.2
2.5	2.3	2.7	0.7	0.5	0.9	0.8	0.6	1.0
2.8	2.6	3.0	0.5	0.3	0.7	0.6	0.4	0.8
3.0	2.8	3.2	0.3	0.2	0.5	0.4	0.2	0.6

Attraction Range

Matte Films

A490/A491 are regular matte PET films that are used for flexible packaging , Label facestock and liners and Industrial applications.

These films are available with different treatment like corona, chemical or Acrylic etc. to suit intended applications.

Thickness available are from 48 ga onwards.

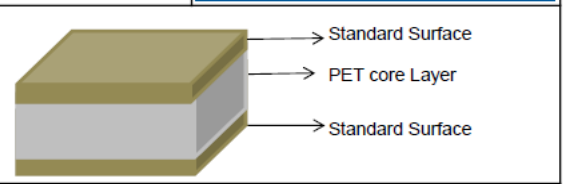
These films are also available in Metallised types AM490 , AM491 etc.

Technical Data Sheet

ARYAFILM - A490

ARYAFILM

ARYAFILM A490 is Matte Polyester film , Both sides untreated. This film is suitable for label & flexible packaging applications



Sr. No.	Properties		Unit	Test Method	Target	Minimum	Maximum
General							
1	Thickness		Micron	JBF Method	12.0	11.64	12.36
			Gauge		48.00	46.56	49.44
2	Yield		M^2/Kg	JBF Method	59.52	57.79	61.36
3	Density		gm/cc	ASTM D 1505	1.395		
4	Roll width		mm	JBF Method	`- 0 , + 3		
Mechanical							
1	Tensile Strength at break	MD/TD	Kg/cm^2	ASTM D 882	2000	1800	2200
			(Kpsi)		28.4	25.6	31.3
2	Elongation at break	MD	%	ASTM D 882	130	90	170
		TD			120	80	160
3	Co-efficient of friction (One to Other side)	Static	--	ASTM D 1894	0.40	0.30	0.50
		Dynamic			0.35	0.25	0.45
Thermal							
1	Shrinkage @ 150^0 C/30'	MD	%	ASTM D 1204	1.6	1.2	2.0
		TD			0.4	0.0	0.8
2	Melting Point		^0C	DSC	252	250	255
Optical							
1	Haze		%	ASTM D 1003	48.0	42.0	54.0
2	Transmittance		%	ASTM D 1003	87.0	84.0	91.0
3	Gloss (60°)			ASTM D 2457	46.0	40.0	52.0
Surface treatment level							
1	Both side		Dyne/cm	ASTM D 2578	44	42	46

White & Met White Film

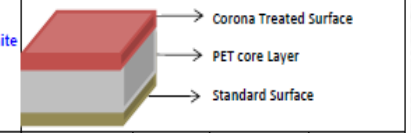
A610 – White PET and AM610 White Met PET are suitable for various Flexible packaging applications which require white background, need light barrier etc.

Available with Corona , various Chemical treatment options in thickness from 48 ga till 10 mil .

JBF Technical Data Sheet **ARYAFILM**

ARYAFILM - A610

ARYAFILM A610 is one side corona treated Milky White polyester film ,this film is suitable for Flexible packaging Application.



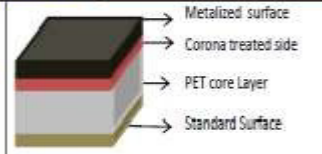
Sr. No.	Properties		Unit	Test Method	Target	Minimum	Maximum
General							
1	Thickness		Micron	JBF Method	12	11.64	12.36
			Gauge		48	46.56	49.44
2	Yield		M^2/Kg	JBF Method	59.52	57.79	61.36
3	Density		gm/cc	ASTM D 1505	1.395		
4	Service Temp		°C	JBF Method	-70 to 150		
Mechanical							
1	Tensile Strength at break	MD/TD	Kg/cm^2	ASTM D 882	2100	1900	2300
			(Kpsi)		29.9	27.0	32.7
2	Elongation at break	MD	%	ASTM D 882	130	90	170
		TD			120	80	160
3	Co-efficient of friction (One side to Other side)	Static	--	ASTM D 1894	0.45	0.35	0.55
		Dynamic			0.40	0.30	0.50
Thermal							
1	Shrinkage @ 150° C/30'	MD	%	ASTM D 1204	1.8	1.2	2.4
		TD			0.4	0.0	0.8
2	Melting Point		°C	DSC	252	250	255
Optical							
1	Haze		%	ASTM D 1003	95.0	90.0	100.0
2	Transmittance		%	ASTM D 1003	50	45	55
Surface treatment level							
1	Corona Treated side		Dynes/cm	ASTM D 2578	54	52	56
2	Plain Side		Dynes/cm	ASTM D 2578	44	42	46
Electrical							
1	Break Down Voltage		KV	ASTM D 149	3.5	3	4

MD = Machine Direction, TD = Transverse Direction

JBF Technical Data Sheet **ARYAFILM**

ARYAFILM AM610

ARYAFILM AM610 is Metalized on corona treated side other side plain milky white polyester film.



Sr. No.	Properties		Unit	Test Method	Target	Minimum	Maximum
General							
1	Thickness		Micron	JBF Method	12.00	11.64	12.36
			Gauge		48.00	46.56	49.44
2	Yield		M^2/Kg	JBF Method	57.87	56.18	59.66
Mechanical							
1	Tensile Strength at break	MD/TD	Kg/cm^2	ASTM D 882	2100	1900	2300
			(Kpsi)		29.9	27.0	32.7
2	Elongation at break	MD	%	ASTM D 882	130	90	170
		TD			120	80	160
3	Co-efficient of friction One side to Other side	Static	--	ASTM D 1894	0.60	0.50	0.70
		Dynamic			0.55	0.45	0.65
4	Metal Bond Strength		gm/25 mm	TP-105-92	250	200	300
Thermal							
1	Shrinkage @ 150° C/30'	MD	%	ASTM D 1204	2.0	1.6	2.6
		TD			0.4	0.0	0.8
2	Melting Point		°C	DSC	252	250	255
Surface treatment level							
1	Standard Surface		Dynes/cm	ASTM D 2578	44	42	46
Barrier							
Optical Density (JBF Method)			M.V.T.R. (ASTM F 1249) gm/m2/day (38°C 90%RH)			O.T.R. (ASTM D 3985) cc/m2/day (23°C 0 %RH)		
Target	Minimum	Maximum	Target	Minimum	Maximum	Target	Minimum	Maximum
2.2	2.0	2.4	0.9	0.7	1.1	1.0	0.8	1.2
2.5	2.3	2.7	0.7	0.5	0.9	0.8	0.6	1.0
2.8	2.6	3.0	0.5	0.3	0.7	0.6	0.4	0.8

High Barrier Range

High OD Met PET Upto 3.6 OD

AM451, High OD Met PET films are suitable for replacement of Alu Foils

as these films provide ultra high barriers.

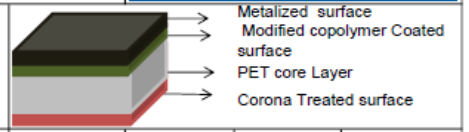
Comparison of other properties for METPET and Aluminum foil

Sr. No	Properties	Al Foil (9 Micron)	Met PET (12 mic.)
01	Yield (M2/kg)	41.0	59.52
02	Cost	Expansive	Cheaper
03	Pin holes	100 nos/m2	0.01 nos/m2
04	Contamination	High , Due to oil used during annealing of foil	No any contamination
05	M/c Performance	Low speed running	High speed running
06	Flex crack resistance	Poor	High
07	puncture resistance	Poor	High

Technical Data Sheet
ARYAFILM AM451

ARYAFILM

ARYAFILM AM451 is metalized on modified co-polymer Coated surface other side corona treated side polyster film , promoting very high bond strength. this film is suitable for flexible packaging applications where in it is required to resist Sterilization in hot water or steam



Sr. No.	Properties		Unit	Test Method	Target	Minimum	Maximum
	General						
1	Thickness		Micron	JBF Method	12.00	11.64	12.36
			Gauge		48.00	46.56	49.44
2	Yield		M^2/Kg	JBF Method	59.52	57.79	61.36
	Mechanical						
1	Tensile Strength at break	MD/TD	Kg/cm^2	ASTM D 882	2000	1800	2200
			(Kpsi)		28.4	25.6	31.3
2	Elongation at break	MD	%	ASTM D 882	130	90	170
		TD			120	80	160
3	Co-efficient of friction One side to Other side	Static	--	ASTM D 1894	0.60	0.50	0.70
		Dynamic			0.55	0.45	0.65
4	Metal Bond Strength		gm/25 mm	TP-105-92	800	700	900
	Thermal						
1	Shrinkage @ 150^0C/30'	MD	%	ASTM D 1204	2.0	1.4	2.6
		TD			0.4	0.0	0.8
2	Melting Point		^{0}C	DSC	252	250	255
	Surface treatment level						
1	Corona Treated surface		Dynes/cm	ASTM D 2578	52	50	54
	Barrier						
	Optical Density (JBF Method)		M.V.T.R. (ASTM F 1249) gm/m2/day (38°C 90%RH)		O.T.R. (ASTM D 3985) cc/m2/day (23°C 0 %RH)		
Target	Minimum	Maximum	Target	Minimum	Maximum	Target	Minimum	Maximum
2.2	2.0	2.4	0.9	0.7	1.1	1.0	0.8	1.2
2.5	2.3	2.7	0.7	0.5	0.9	0.8	0.6	1.0
2.8	2.6	3.0	0.5	0.3	0.7	0.6	0.4	0.8
3.0	2.8	3.2	0.3	0.2	0.5	0.4	0.2	0.6