# 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





## 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

			echnical Da		AR	YAF	ILM
eat sea	LM A500 is co extruded Ilable layer is designed t PET, PVC etc suitable fo le.	o heat seal	to itself or		$\rightarrow$	> Standard Surf PET core Lay> Sealable Surf	er
Sr. No.	Properties		Unit	Test Method	Target	Minimum	Maximum
			G	eneral			
	<b>T</b>   1		Micron	and the later	12.0	11.64	12.36
1	Thickness		Gauge	JBF Method	48.00	46.56	49.44
2	Yield		M <sup>2</sup> /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	
			Med	hanical			
			Kg/cm <sup>2</sup>		1900	1700	2100
1	Tensile Strength at break	MD/TD	(Kpsi)	ASTM D 882	27.0	24.2	29.9
		MD			130	90	170
2	Elongation at break	TD	%	ASTM D 882	120	80	160
	Co-efficient of friction	Static			0.50	0.40	0.60
3	(One to Other side)	Dynamic		ASTM D 1894	0.45	0.35	0.55
4	Heat Seal Strength (Seal to Seal) @120°C/2 Sea		gm/25mm	JBF Method	350	250	550
			Th	ermal			
		MD			1.8	1.2	2.4
1	Shrinkage @ 150 <sup>0</sup> C/30'	TD	%	ASTM D 1204	0.4	0.0	0.8
2	Melting Point		°c	DSC	252	250	255
			0	ptical			
1	Haze		%	ASTM D 1003	3.5	2.5	4.5
2	Transmittance		%	ASTM D 1003	88.0	85.0	91.0
			Surface tr	eatment level			
1	Plain side		Dyne/cm	ASTM D 2578	44	42	46
2	Sealable side		Dyne/cm	ASTM D 2578	46	44	48
				arrier			
			gm/m²/day		40	30	50
1	W.V.T.R. (38°C & 90% RH)		gm/100in²/day	ASTM F 1249	2.58	1.94	3.23
	0 T.B. (338C 8 09( BH))		cc/m²/day	ACTN D 2005	100	80	120
2	O.T.R. (23°C & 0%RH)		cc/100in²/day	ASTM D 3985	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
  - S400 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 Linkhttps://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.

B	987 AHRAIN		echnical D ARYAFILM -		AR	YAF	ILM
m spe	LM A100 is Both side Pla cially for reprographics, ensitive coating application	packaging				Standard Sur PET core Lay > Standard Sur	/er
Sr. No.	Properties		Unit	Test Method	Target	Minimum	Maximum
	•		G	eneral			
	-		Micron		50.0	49.00	51.00
1	Thickness		Gauge	JBF Method	200.00	196.00	204.00
2	Yield		M <sup>2</sup> /Kg	JBF Method	14.29	14.01	14.58
3	Density		gm/cc	ASTM D 1505		1.395	
4	Roll width	toll width mm JBF Method					
			Me	chanical			
1	Tensile Strength at break	MD/TD	Kg/cm <sup>2</sup>	ASTM D 882	1900	1700	2100
1	Tensile Strength at break	MU/TU	(Kpsi)	ASTM D 882	27.0	24.2	29.9
2	Elongation at break	MD	%	ACTM D 000	140	100	180
2	Elongation at break	TD	70	ASTM D 882	130	90	170
3	Co-efficient of friction	Static		ASTM D 1894	0.40	0.30	0.50
3	(One to Other side)	Dynamic		ASTM D 1094	0.35	0.25	0.45
			T	hermal			
1	Shrinkage @ 150°C/30'	MD	%	ASTM D 1204	1.4	1.0	1.8
1	Shinikage @ 150 C/30	TD	70	ASTM D 1204	0.4	0.0	0.8
2	Melting Point		°C	DSC	252	250	255
			C	Optical			
1	Haze		%	ASTM D 1003	1.1	0.7	1.5
2	Transmittance		%	ASTM D 1003	90.0	88.0	92.0
			Surface t	reatment 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.

			echnical Da ARYAFILM -		AR	YAF	ILM
polyeste	LM A499 is bi-axially orie er film ,this film is Suitab oducts. (Coating or core	le for liddir	ng application for			Standard / Tr PET core Lay Standard / Tr	er
Sr. No.	Properties		Unit	Test Method	Target	Minimum	Maximum
			G	eneral			
			Micron	and the later	12.0	11.64	12.36
1	Thickness		Gauge	JBF Method	48.00	46.56	49.44
2	Yield		M²/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	
			Me	chanical			
1	Teach Occurst a burd	MD/TD	Kg/cm <sup>2</sup>	ASTM D 882	2000	1800	2200
1	Tensile Strength at break	MD/TD	(Kpsi)	ASTM D 662	28.4	25.6	31.3
2	Elongation at break	MD	96	ASTM D 882	130	90	170
2	Elongation at break	TD	70	A5111 D 662	120	80	160
3	Co-efficient of friction	Static		ASTM D 1894	0.45	0.35	0.55
-	(One to Other side)	Dynamic	-	701110 1004	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
			Tİ	hermal			
1		MD	%	ASTM D 1204	1.6	1.2	2.0
1	Shrinkage @ 150 <sup>0</sup> C/30'	TD	70	ASTM D 1204	0.4	0.0	0.8
2	Melting Point		°C	DSC	252	250	255
			0	ptical			
1	Haze		%	ASTM D 1003	3.5	2.5	4.5
2	Transmittance		%	ASTM D 1003	88.0	85.0	91.0
			Surface tr	reatment level			
1	Both side		Dyne/cm	ASTM D 2578	44	42	46
			В	arrier			
1	W.V.T.R. (38°C & 90% RH)		gm/m²/day	ASTM F 1249	40	30	50
•			gm/100in²/day		2.58	1.94	3.23
2	O.T.R. (23°C & 0%RH)		cc/m²/day	ASTM D 3985	100	80	120
	· · · ·		cc/100in²/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.

	98 <b>7</b> Mirain		echnical Da ARYAFILM -		AR	YAF	LM
lain (op	LM A403 is One side Che otion for corona treated) is suitable for PU resins	transparen				Chemical Coa PET core Lay> Standard / Co	er
Sr. No.	Properties		Unit	Test Method	Target	Minimum	Maximum
			Ge	eneral			
	Thicknood		Micron		50.0	49.00	51.00
1	Thickness		Gauge	JBF Method	200.00	196.00	204.00
2	Yield		M <sup>2</sup> /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	
			Mec	chanical			
1	Tensile Strength at break	MD/TD	Kg/cm <sup>2</sup>	ASTM D 882	1900	1700	2100
1	Tensile Scienger at break	MOTO	(Kpsi)	A3111 D 002	27.0	24.2	29.9
2	Elongation at break	MD	%	ASTM D 882	140	100	180
-	Longatori at break	TD	/0	ASTITU 002	130	90	170
3	Co-efficient of friction	Static		ASTM D 1894	0.40	0.30	0.50
	(One to Other side)	Dynamic		ASTRIC 1001	0.35	0.25	0.45
			Th	ermal			
1	Shrinkage @ 150 <sup>0</sup> C/30'	MD	%	ASTM D 1204	1.4	1.0	1.8
<u> </u>	Shininaye @ 150 C/50	TD		A01110 1201	0.4	0.0	0.8
2	Melting Point		°C	DSC	252	250	255
			0	ptical			
1	Haze		%	ASTM D 1003	7.0	5.0	9.0
2	Transmittance		%	ASTM D 1003	88.0	85.0	91.0
			Surface tr	eatment level			
	Chemical Coated Side						
1	Chemical Coated Side		Dyne/cm	ASTM D 2578	66	64	68

## DIRECT EMBOSSABLE

A503 is Direct Embossable film and is suita<u>ble for</u> <u>Holographic</u> application.

Film is available in various thickness from 48 ga onwards.

Available in PET A503 and Met PET AM503 variants.

		_	echnical Da ARYAFILM -		AR	YAFI	LM
aving o or direc	LM A503 is co-extruded one side direct embossa at embossing without an g deep & sharp impress	ble layer,th y offline co	is film is suitable			> Embossable \$PET core Lay> Standard Surf	er
Sr. No.	Properties		Unit	Test Method	Target	Minimum	Maximum
			G	General			
1	Thickness		Micron	JBF Method	13.0	12.61	13.39
-	THICKIESS		Gauge		52.00	50.44	53.56
2	Yield		M <sup>2</sup> /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	
			Me	chanical			
1	Tensile Strength at break	MD/TD	Kg/cm <sup>2</sup>	ASTM D 882	2100	1900	2300
1	Tensile Strength at break	MD/TD	(Kpsi)	ASTM D 662	29.9	27.0	32.7
2	Elongation at break	MD	%	ASTM D 882	130	90	170
2	Elongation at Dreak	TD	70	ASTM D 002	120	80	160
3	Co-efficient of friction	Static		ASTM D 1894	0.50	0.40	0.60
3	(One to Other side)	Dynamic		ASTM D 1894	0.45	0.35	0.55
			TI	nermal			
1	Shrinkage @ 150 <sup>0</sup> C/30'	MD	%	ASTM D 1204	1.8	1.2	2.4
T	Sminkage @ 150° C/30'	TD	70	A51M D 1204	0.4	0.0	0.8
2	Melting Point		°c	DSC	252	250	255
			0	ptical			
1	Haze		%	ASTM D 1003	2.5	1.5	3.5
2	Transmittance		%	ASTM D 1003	88.0	85.0	91.0
			Surface t	reatment level			
1	Embossable side		Dyne/cm	ASTM D 2578	40	38	42
	Embossable side Plain side						

## 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.

	LM A206 is optically clea mping Foil application.	ır Polyester	film suitable for			Standard Surf PET core LayStandard Surf	er
Sr. No.	Properties		Unit	Test Method	Target	Minimum	Maximum
			G	eneral		•	
1	Thicknose		Micron	IRE Mothed	12.0	11.64	12.36
1	Thickness		Gauge	JBF Method	48.00	46.56	49.44
2	Yield		M <sup>2</sup> /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	
			Me	chanical			
1	Tensile Strength at break	MD/TD	Kg/cm <sup>2</sup>	ASTM D 882	2000	1800	2200
1	Tensile Sulengur at break	MD/TD	(Kpsi)	ASTM D 662	28.4	25.6	31.3
2	Elongation at break	MD	%	ASTM D 882	130	90	170
2	Elongation at break	TD	70	ASTIN D 002	120	80	160
3	Co-efficient of friction	Static		ASTM D 1894	0.45	0.35	0.55
3	(One to Other side)	Dynamic		A310 0 1054	0.40	0.30	0.50
			T	nermal			
1	Shrinkage @ 190°C/20'	MD	%	ASTM D 1204	3.2	2.8	3.6
<u> </u>	Similikaye @ 190 C/20	TD	70	A5110 1204	-0.2	-0.6	0.2
2	Melting Point		°c	DSC	252	250	255
			C	ptical			
1	Haze		%	ASTM D 1003	2.0	1.5	2.5
	Transmittance		%	ASTM D 1003	89.0	86.0	92.0

## 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.

	AHRAIN		ARYAFILM - /	4438		YAF	
ther sid	LM A438 is one side higl de acrylic coated polyest ing, lamination, and big	er film.this	film is suitable			Acrylic Coated PET core Lay Functional Su	er
Sr. No.	Properties		Unit	Test Method	Target	Minimum	Maximum
				neral			
			Micron	ment of the	12.0	11.64	12.36
1	Thickness		Gauge	JBF Method	48.00	46.56	49.44
2	Yield		M²/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	
			Mech	nanical			
1	Tensile Strength at break	MD/TD	Kg/cm <sup>2</sup>	ASTM D 882	2000	1800	2200
1	Tensile Scienger at break	HD/TD	(Kpsi)	A3111 D 002	28.4	25.6	31.3
2	Elongation at break	MD	%	ASTM D 882	130	90	170
-	Liongation at orean	TD	~	101110-002	120	80	160
3	Co-efficient of friction	Static		ASTM D 1894	1.00	0.80	Block
<u> </u>	(Functional to Functional)	Dynamic			1.00	0.80	Block
			The	ermal			
1	Shrinkage @ 150º 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
				tical			
1	Haze		%	ASTM D 1003	3.0	2.0	4.0
2	Transmittance		%	ASTM D 1003	88.0	85.0	91.0
				atment level			
1	Acrylic coated side		Dyne/cm	ASTM D 2578	40	38	42
2	Functional side		Dyne/cm	ASTM D 2578	44	42	46
				rrier			
1	W.V.T.R. (38°C & 90% RH)		gm/m²/day	ASTM F 1249	40	30	50
	. ,		gm/100in²/day		2.58	1.94	3.23
2	O.T.R. (23°C & 0%RH)		cc/m²/day	ASTM D 3985	100	80	120

## 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.

	87 HRAIN	-	echnical Da ARYAFILM -					
suitable	M A450 is both side pla e for thermal lamination roperties in transverse	n due to its				Standard Sur PET core Lay Standard Sur	er	
r. No.	Properties		Unit	Test Method	Target	Minimum	Maximum	
			G	eneral	_			
1 1	Thickness		Micron	JBF Method	12.0	11.64	12.36	
· ·	incluie 35		Gauge	Sbi Mediod	48.00	46.56	49.44	
2 Y	/ield		M <sup>2</sup> /Kg	JBF Method	59.52	57.79	61.36	
3 C	Density		gm/cc	ASTM D 1505		1.395		
4 R	Roll width		mm	JBF Method		`-0,+3		
			Med	chanical				
1 1	Fensile Strength at break	MD/TD	Kg/cm <sup>2</sup>	ASTM D 882	2000	1800	2200	
1	ensile strength at break	MUTU	(Kpsi)	ASTM D 662	28.4	25.6	31.3	
2 E	longation at break	MD	%	ASTM D 882	130	90	170	
2	tongation at break	TD	70	ASTM D 662	120	80	160	
	Co-efficient of friction	Static		ASTM D 1894	0.45	0.35	0.55	
° (	One to Other side)	Dynamic		ASTIN D 1894	0.40	0.30	0.50	
			Th	ermal				
1 5	Shrinkage @ 150 <sup>0</sup> C/30'	MD	%	ASTM D 1204	2.0	1.4	2.6	
1 3	Shirinkage @ 150 C/50	TD	70	AS111 D 1204	1.8	1.2	2.4	
2 N	Aelting Point		°C	DSC	252	250	255	
			0	ptical				
1	laze		%	ASTM D 1003	3.5	2.5	4.5	
2 T	Fransmittance		%	ASTM D 1003	88.0	85.0	91.0	
			Surface tr	eatment level				
	Both side		Dyne/cm	ASTM D 2578	44	42	46	
1 8			В	arrier				
1 8		W V T D (2000 0 000( DU)						
-	NVTR (38°C & 90% PU)		gm/m²/day	ASTM E 1249	40	30	50	
-	N.V.T.R. (38°C & 90% RH)			ASTM F 1249	40 2.58	30 1.94	50 3.23	
1 V	V.V.T.R. (38°C & 90% RH)		gm/m²/day	ASTM F 1249 ASTM D 3985				

# 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.

B	98 <b>F</b> Ahrain		echnical Da ARYAFILM -		AR	YAF	ILM
	LM A443 is both side pla s film is suitable for cand				$\longrightarrow$	Standard Sur PET core Lay Standard Sur	er
Sr. No.	Properties		Unit	Test Method	Target	Minimum	Maximum
			G	eneral		_	
1	Thickness		Micron	JBF Method	18.0	17.64	18.36
<u> </u>	THEN ICOD		Gauge	JDI Mediou	72.00	70.56	73.44
2	Yield		M²/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 <sup>2</sup>	ASTM D 882	2200	2000	2400
1	Tensile Strength at break	MUTU	(Kpsi)	A3111 D 002	31.3	28.4	34.1
2	Elongation at break	MD	%	ASTM D 882	130	90	170
<u> </u>	clongation at break	TD	~	83111 0 002	120	80	160
3	Co-efficient of friction	Static	-	ASTM D 1894	0.45	0.35	0.55
<u> </u>	(One to Other side)	Dynamic		AS111 D 1054	0.40	0.30	0.50
			Th	iermal			
1	Shrinkage @ 150 <sup>0</sup> C/30'	MD	%	ASTM D 1204	30.0	25.0	35.0
<u> </u>	Similikaye @ 150 C/30	TD	70	A51010 1204	35.0	30.0	40.0
2	Melting Point		°c	DSC	252	250	255
			0	ptical			
1	Haze		%	ASTM D 1003	4.0	3.0	5.0
2	Transmittance		%	ASTM D 1003	88.0	85.0	91.0
			Surface tr	eatment level			
1	Both side		Dyne/cm	ASTM D 2578	44	42	46
			В	arrier			
1	W.V.T.R. (38°C & 90% RH)		gm/m²/day	ASTM F 1249	28	18	38
1	W.W.I.R. (50 C α 90% KH)		gm/100in²/day	AD101F 1249	1.81	1.16	2.45

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olyeste	r film suitab	le for candy	ble Metalized o wrapping appl arrier properti	ications,			Metalized sur Plain Surface PET core Lay Standard surf	er
Sr. No.		Properties	:	Unit	Test Method	Target	Minimum	Maximum
				Gener	al			
1	Thickness			Micron	JBF Method	18.00	17.64	18.36
1	Thickness			Gauge	Jor Method	72.00	70.56	73.44
2	Yield			M <sup>2</sup> /Kg	JBF Method	39.68	38.90	40.49
				Mechan	ical			
	The state of		MD/TD	Kg/cm <sup>2</sup>		2200	2000	2400
1	Tensile Stren	gth at break	MD/TD	(Kpsi)	ASTM D 882	31.3	28.4	34.1
2	Flower time of bounds		MD	%	ASTM D 882	130	90	170
2	Elongation at break		TD	70	ASTM D 662	120	80	160
3	Co-efficient o	of friction One	Static		ASTM D 1894	0.60	0.50	0.70
3	side to Other	side	Dynamic		ASTM D 1094	0.55	0.45	0.65
				Therm	al			
1	Shrinkage @	4500 0/201	MD	%	ASTM D 1204	30.0	25.0	35.0
1	Shrinkage @	150° C/30	TD	70	ASTM D 1204	35.0	30.0	40.0
2	Melting Point			°c	DSC	252	250	255
				Surface treats	nent level			
1	Standard su	rface		Dynes/cm	ASTM D 2578	44	42	46
				Barrie	er			
	Optical Den	sity	M.V	.T.R. (ASTM F 1	1249)	0.1	r.r. (Astm d 3	3985)
	(JBF Meth	od)	gm/m	2/day (38°C 90	1%RH)	cc/m2	2/day (23°C 0	%RH)
Target	t 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.

	9 <i>87</i>		echnical D ARYAFILM -		AR	YAF	II M	9	8.	
ARYAFI	LM A643 is milky White f	old retaina	ble polyester film	A045		Standard Sur	face	milky wh for cand	M AM643 is ite fold reta y wrapping a barrier prop	inable applic
this tiin	n is suitable for candy w	rapping ap	plication.			Standard Sur	face	Sr. No.		Pro
									1	
Sr. No.	Properties		Unit	Test Method	Target	Minimum	Maximum	1	Thickness	
			G	eneral				2	Yield	
	Thickness		Micron	JBF Method	18.0	17.64	18.36		There	
1	Thickness		Gauge	JRF Method	72.00	70.56	73.44			
2	Yield		M²/Kg	JBF Method	38.58	37.82	39.37	1	Tensile Stren	igth at
3	Density		gm/cc	ASTM D 1505		1.44				
4	Roll width		mm	JBF Method		`-0,+3		2	Elongation at	t break
			Me	chanical	-				Co-efficient o	of fricti
	To all the state of the state	100/770	Kg/cm <sup>2</sup>	10774 D 000	2200	2000	2400	3	side to Other	
1	Tensile Strength at break	MD/TD	(Kpsi)	ASTM D 882	31.3	28.4	34.1			
		MD			130	90	170			
2	Elongation at break	TD	%	ASTM D 882	120	80	160	1	Shrinkage @	150° C
	Co-efficient of friction	Static			0.45	0.35	0.55	2	Melting Point	t
3	(One to Other side)	Dynamic		ASTM D 1894	0.40	0.30	0.50			
			T	hermal				1	Standard Sur	face
		MD			30.0	25.0	35.0			
1	Shrinkage @ 150 <sup>0</sup> C/30'	TD	%	ASTM D 1204	35.0	30.0	40.0		Optical Den	sity
2	Melting Point		°c	DSC	252	250	255		(JBF Meth	od)
			C	ptical	- <b>!</b>			Target	Minimum	Max
1	Haze		%	ASTM D 1003	95.0	90.0	100.0	2.2	2.0	2
2	Transmittance		%	ASTM D 1003	50.0	45.0	55.0	2.5	2.3	2
	I		Surface t	reatment level				2.8	2.6	
	Both side				44			3.0	2.8	3

Į	8:	F		inical Dat RYAFILM		AR	YAF	
nilky wh or cand	ite fold reta	inable polyes applications,	n plain side otl ster film. This f especially for	film is suitable		$\overrightarrow{}$	Metalized sur Plain Surface PET core Laye Standard Surf	er
Sr. No.		Properties		Unit	Test Method	Target	Minimum	Maximu
				Gener	al			
	Thickness			Micron	105 Mailard	18.00	17.64	18.36
1	THICKNESS			Gauge	JBF Method	72.00	70.56	73.44
2	Yield			M <sup>2</sup> /Kg	JBF Method	38.58	37.82	39.37
				Mechan	ical			
	- 1.0			Kg/cm <sup>2</sup>		2200	2000	2400
1	Tensile Stren	gth at break	MD/TD	(Kpsi)	ASTM D 882	31.3	28.4	34.1
		l	MD			130	90	170
2	Elongation at break		TD	%	ASTM D 882	120	80	160
	Co-efficient o	of friction One	Static			0.60	0.50	0.70
3	side to Other	side	Dynamic	-	ASTM D 1894	0.55	0.45	0.65
				Thermal				
1		4500 0 (20)	MD	%	ASTM D 1204	30.0	25.0	35.0
1	Shrinkage @	150° C/30	TD	0	ASTM D 1204	35.0	30.0	40.0
2	Melting Point			°c	DSC	252	250	255
				Surface treatn	nent level			
1	Standard Sur	face		Dynes/cm	ASTM D 2578	44	42	46
				Barrie	r			
	Optical Den	sity	M.V	T.R. (ASTM F 1	249)	0.1	F.R. (ASTM D 3	985)
	(JBF Meth	od)	gm/m	12/day (38°C 90	%RH)	cc/m2	2/day (23°C 0 9	%RH)
Target	Minimum	Maximum	Target	Minimum	Maximum	Target	Minimum	Maximu
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.

B	<b>987</b> MRAIN		echnical D ARYAFILM -		AR	YAF	ILM		
ntreate	LM A490 is Matte Polyes d. This film is suitable f ng applications					Standard Surf PET core LayStandard Surf	er		
Sr. No.	Properties		Unit	Test Method	Target	Minimum	Maximum		
			G	eneral					
1	Thickness		Micron	JBF Method	12.0	11.64	12.36		
1			Gauge	JBF Method	48.00	46.56	49.44		
2	Yield		M <sup>2</sup> /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				
			Me	chanical					
1	Tensile Strength at break	MD/TD	Kg/cm <sup>2</sup>	ASTM D 882	2000	1800	2200		
1			(Kpsi)	ASTM D 002	28.4	25.6	31.3		
2	Elongation at break	MD	%	ASTM D 882	130	90	170		
2		TD	70		120	80	160		
3	Co-efficient of friction (One to Other side)	Static		ASTM D 1894	0.40	0.30	0.50		
5		Dynamic		ASTIN D 1094	0.35	0.25	0.45		
			Т	hermal					
1	Shrinkage @ 150 <sup>0</sup> C/30'	MD	%	ASTM D 1204	1.6	1.2	2.0		
-		TD	70		0.4	0.0	0.8		
2	Melting Point		°c	DSC	252	250	255		
			C	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 t	reatment 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 suitab<u>le for various Flexible</u> 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 .

287 Technical Date ARYAFILM -						98 <b>F</b>			Technical Data Sheet ARYAFILM AM610					
olyest	ILM A610 is one side co er film ,this film is suita ing Application.				$\rightarrow$	Corona Treated PET core Layer Standard Surfac		12 12 12 12 12			d on corona olyester film	i treated side 1.	4	
Sr. No.	Properties		Unit	Test Method	Target	Minimum	Maximum	-		Description				
			Gen	eral				Sr. No.		Propertie	5	Unit Gene	Test Metho	
	1 Thickness Gauge 2 Yield M <sup>2</sup> /Kg		Micron	JBF Method	12	11.64	12.36		Thickness		Micron	101		
1			Gauge		48	46.56	49.44	1			Gauge	JBF Method		
2			M²/Kg	JBF Method	59.52	57.79	61.36	2 Yield				M <sup>2</sup> /Kg	JBF Method	
3			gm/cc	ASTM D 1505		1.395		2 100				Mechanical		
4	Service Temp		°C	JBF Method		-70 to 150					Kg/cm <sup>2</sup>			
	Mech			anical				13	Tensile Strength at MD/TD break		(Kpsi)	ASTM D 88		
1	Tensile Strength at break	MD/TD	Kg/cm <sup>2</sup>	ASTM D 882	2100	1900	2300	-			MD	19772		
1		HD/TD	(Kpsi)		29.9	27.0	32.7	2	Elongation a	at break	TD		ASTM D 88	
_	Elongation at break	MD	%	ASTM D 882	130	90	170		Co-efficient	of friction	Static	-		
2		TD	70		120	80	160	3	One side to			Dynamic	A5TM D 189	
_	Co-efficient of friction	Static			0.45	0.35	0.55	4	Metal Bond	Shearth	-	gm/25 mm	TP-105-92	
3	(One side to Other side)	Dynamic	-	ASTM D 1894	0.40	0.30	0.50	-				Ther		
	•		The	mal							MD		T	
	Shrinkage @ 150 <sup>0</sup> C/30'	MD MD	MD	%		1.8	1.2	2.4	1	Shrinkage (	0 150° C/30'	TD	5	ASTM D 120
1		TD	70	ASTM D 1204	0.4	0.0	0.8	2	Neltino Point			ŝr.	DSC	
2	Melting Point	Melting Point <sup>0</sup> C		DSC	252	250	255		- Institute			Surface treatment level		
			Opt	ical				1	Standard Su	stare		Dynes/cm	ASTM D 257	
1	Haze %		ASTM D 1003	95.0 90.0 100.0						Barrier				
2	Transmittance %			ASTM D 1003	50	45	55		Optical Density M.V.			T.R. (ASTM F		
	•		Surface trea	tment level			•		(JBF Meth	od)	gm/n	n2/day (38°C 9	10%RH)	
1	Corona Treated side		Dynes/cm	ASTM D 2578	54	52	56	Target	Minimum	Maximu	Target	Minimum	Maximum	
2	Plain Side		Dynes/cm	ASTM D 2578	44	42	46	2,2	2.0	2.4	0.9	0.7	1.1	
			Elect	rical				2.5	2.3	2.7	0.7	0.5	0.9	
1	Break Down Voltage		КV	ASTM D 149	3.5	3	4	2.8	2.6	3.0	0.5	0.3	0.7	

Corona treated side PET core Laver

Maxing

12,36

49,44

59.66

2300

32,7

170

160

0.70

0.65

300

2.5

0.8

255

46

Maximum

1.2

1.0

0.8

Standard Surface

11.64

46.56

56.18

1900

27.0

.90

60

0.50

0.45

200

1,5

0.0

258

42

O.T.R. (ASTM D 3985) cc/m2/day (23°C 0 %RH

0.8

0.5

0.4

Target

12.00

48.00

57.87

2100

130

120

0.60

0.55

250

2.0

0.4

252

44

Target

1.0

0.8

0.6

# 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

I	8	F		nical Dat RYAFILM		AR	YAF			
Coated s promotir flexible p	surface othe ng very high backaging a	r side corona bond streng	n modified co- a treated side p th. this film is /here in it is re r steam	oolyster film , suitable for			Metalized sur Modified copy surface PET core Lay Corona Treate	olymer Coated er		
Sr. No.		Properties	;	Unit	Test Method	Target	Minimum	Maximum		
General										
1	Thickness	internet			JBF Method	12.00	11.64	12.36		
1 Inickness				Gauge	Sor neurou	48.00	46.56	49.44		
2	Yield			M <sup>2</sup> /Kg	JBF Method	59.52	57.79	61.36		
Mechanical										
	Tensile Strength at break			Kg/cm <sup>2</sup>	40714 0 000	2000	1800	2200		
1			MD/TD	(Kpsi)	ASTM D 882	28.4	25.6	31.3		
2	Elongation at break		MD	%	ASTM D 882	130	90	170		
2			TD	70	ASTIN D 882	120	80	160		
3	Co-efficient o	Co-efficient of friction One			ASTM D 1894	0.60	0.50	0.70		
<u> </u>	side to Other	r side	Dynamic		AS110 1894	0.55	0.45	0.65		
4	Metal Bond S	itrength		gm/25 mm	TP-105-92	800	700	900		
				Therm	al					
1	1 Shrinkage @ 150 <sup>0</sup> C/30'		MD	%	ASTM D 1204	2.0	1.4	2.6		
-			TD	70	A5111 D 1204	0.4	0.0	0.8		
2	Melting Point	:		°c	DSC	252	250	255		
				Surface treatm	nent level					
1	Corona Treat	ted surface		Dynes/cm	ASTM D 2578	52	50	54		
				Barrie	er					
	Optical Den	sity	M.V	1249) O.T.R. (ASTM D 3985)						
	(JBF Meth	od)	gm/m	1%RH)	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		