

ARAF

GLOBAL PARTNERS FOR PET RESIN AND BOPET FILMS



# JB7 Group - Introduction

## Overview

- Global PET producer - Current capacity of **1.1 Million MT**
- 3 manufacturing sites in India, 1 integrated site in UAE, 1 site in Bahrain & Belgium
- Listed on the BSE and NSE in Mumbai India

## Products

- **PET Resins:** Bottle Grade, Film Grade & Yarn Grade
- **Polyester Yarn:** Semi Dull, Full Dull, Bright, Cationic
- **BOPET Films:** 8mic to 350mic for Packaging, Industrial and Electrical applications

## Facilities

- Indian facility (Chips, Polyester Yarn) caters to the Indian market
- UAE, Bahrain & Belgium facilities cater to more than 110 countries worldwide



POLYESTER RESIN



BOTTLE GRADE RESIN



BOPET FILMS



PARTIALLY ORIENTED YARN



FULLY DRAW YARN



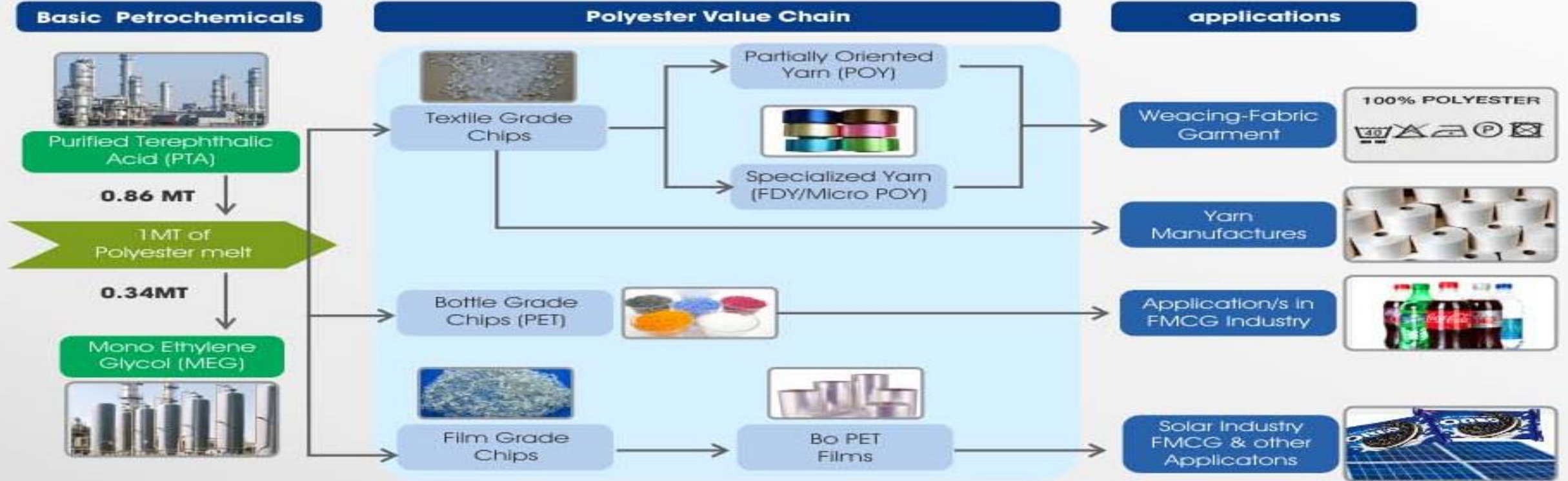
POLYESTER TEXTURED YARN



# JBF Business Value Chain



## Business Value Chain



### Value addition across the Polyester Chain

Backward Integration Plans

Value Chain Segments Covered by JBF

Industry Application



# BOPET FILMS BUSINESS

**Total BOPET Film Capacity** **175,000 MTA**

**No. of Production Lines** **7**

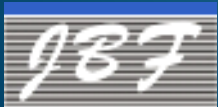
## UAE Facility

<b>BOPET Film Capacity</b>	<b>80,000 MTA</b>
<b>Metalized Film Capacity</b>	<b>10,000 MTA</b>
<b>ALOX Film Capacity</b>	<b>3,000 MTA</b>
<b>Specialty Coated Films Capacity</b>	<b>3,000 MTA</b>

## BAHRAIN Facility

<b>Plain Film Capacity</b>	<b>63,000 MTA</b>
<b>Metalized Film Capacity</b>	<b>9,000 MTA</b>

**JBF also has in-house production of Heat Treated Wooden Pallets , End Fitments , Core Plugs and Paper Cores .**



# JBF RAK LLC - UAE

## JBF RAK BOPET FILM PLANT

Technology Provider -

Dornier, Germany

Capacity - 96,000 MTA

Thickness - 12 Micron to 350 Mic

Products -

Packaging Grade Films

Optically Clear Films

Electrical & industrial Grade

Industrial Films

Metalized Films

ALOX & Coated Films



# DORNIER

State of the Art BOPET Film Lines From Dornier

Thin Film Capacity: 54,000MTA

Thick Film Capacity: 18,000MTA



# CLEAN ROOM BOPET LINES



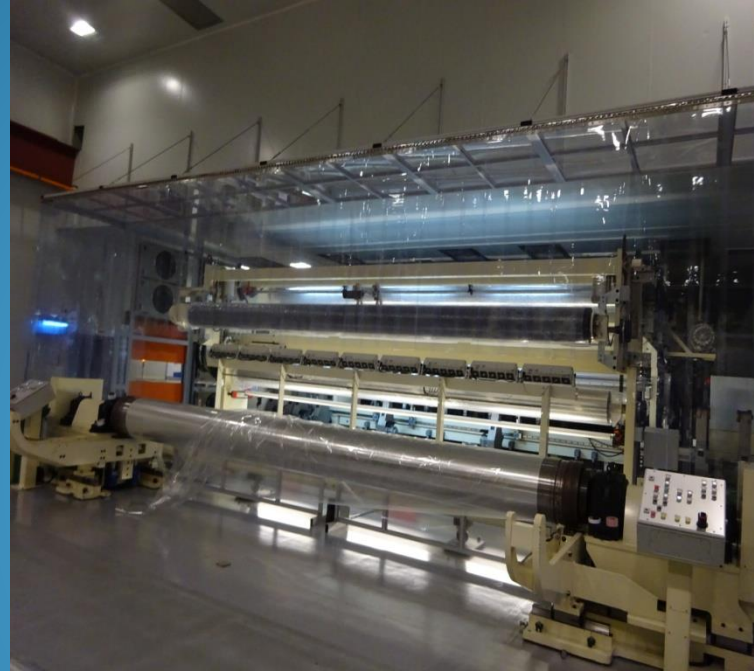
JBF has setup clean room facility in one of the production line to manufacture film for critical applications such as LCD screens, touch screens and protection films, as these films require a smooth, clean surface, which is ideal for optical coatings.

Line 4 in RAK has clean room condition. This line produces clear and super clear films which are dust & scratch free and suited for optical coatings. Clean room condition is maintained right from film casting stage till final packing of film rolls. Very stringent checks are maintained at each stage of production.

8.7 meters wide, Line 7 in Bahrain operates in clean room conditions and is capable of producing clear and super clear films from 8 Micron ( 32 Gauge ) till 125 Micron ( 500 Gauge ) in thickness.

This line is also one of the largest clean room facility globally for producing BOPET films. Clean room conditions are maintained from film casting stage to finished goods packing.

# PET FILM LINES WITH CLEAN ROOM CONDITIONS



- JBF is now capable of producing “Dust and Scratch Free” clear and super clear BOPET films in thickness range of 10 micron ( 40 Gauge ) to 250 micron ( 1000 Gauge) in Class 1000/ 10000 clean room conditions .

Films produced have a smooth and clean surface which is ideal for Optical Coatings used for Window, Medical, Electronics, Flexible packaging, Graphics applications.





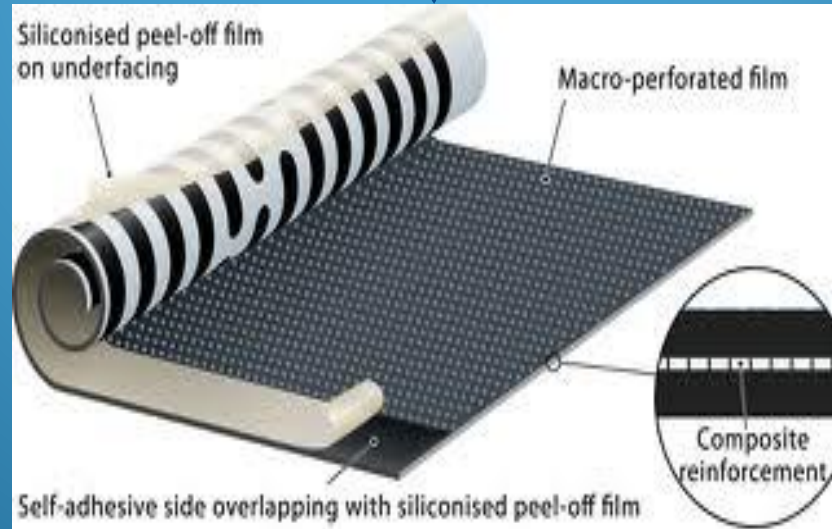
# ONLINE DEFECT DETECTION SYSTEM



JBF clean room lines have Online Defect Detection and Analysis System

# 987 – Touching Daily Lives

## THICK BOPET FILMS



# TYPES OF SURFACE TREATMENT

**Thickness range : 50 to 350mic**

## **Untreated Films:**

- Surface tension: 42 dyne/cm
- Application: Release liners, hot stamping foil

## **Corona Treated:**

- Surface tension: 56 dyne/cm
- Application: printing & lamination for dry products

## **Acrylic coated:**

- Surface tension: 40 dyne/cm
- Application: printing with only solvent based inks and UV inks

## **Co-polyester coated:**

- Surface tension: 56 dyne/cm
- Application: printing with water based and solvent based inks & for metalizing



# Specialty Inline and Offline Coated Films

- Antistatic Coated
- Slip Coated
- Anchor Coated
- PU Coated
- Anti-fog Coated

# BASED ON COLOR / HAZE OF FILM

- SUPER CLEAR FILMS --- 100 Series ---Haze Minimum 1%
- CLEAR FILMS -- 200 & 300 Series -- Haze Minimum 2%
- HAZY FILMS -- 400 Series -- With Varying haze levels medium to High Haze
- MATTE FILMS -- 390 & 490 Series
- MILKY WHITE FILMS – 600 Series –Translucent
- WHITE OPAQUE FILMS -- 660 Series – TiO<sub>2</sub> based



# Industrial Applications of Thick PET Films

## TAPES

Grade : A460

Thickness range :  
12mic to 50mic

Type of films:  
Transparent & Metalized

Key Properties:  
Thermally stable film  
Nil shrinkage  
High Gloss



## SILICONIZING

Grade : A470 , A471 , A370, A371

Thickness range:  
12mic to 125mic

Type of films:  
Transparent

Key Properties:  
Thermally stable film

Applications: Release Liners



## FRP & OTHER INDUSTRIAL

Grade : A460

Thickness range :  
15 to 36mic

Type of films:  
Transparent & Metalized

Applications:  
▪ Vinyl sheet casting  
▪ FRP Release  
▪ Window

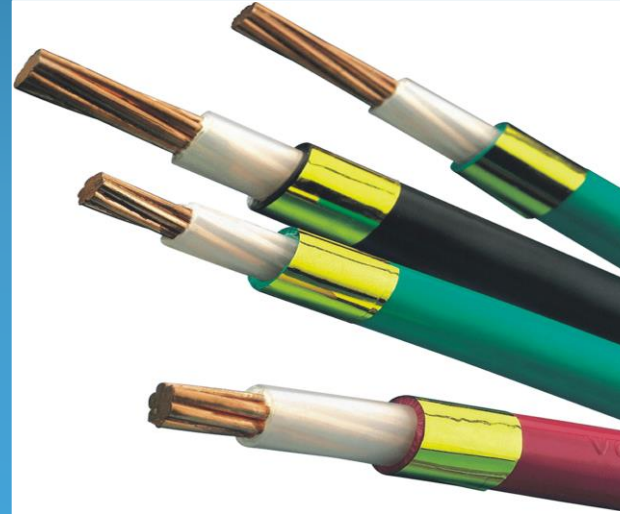


# Electrical Insulation

- Film Types – A460 , A461 , A488, A600
- Thickness range : 12mic to 250mic
- Type of film: Untreated & Corona

## Applications:

- Cable insulation
- Motor Winding Insulation
- Transformer Tubes and Insulation
- Lamination with Aluminum Foil & Copper
- Floor Heating
- MTS



# A488 – Insulation Film

**Grade : A488**

**Thickness range :  
36mic to 250mic**

**Type of film:  
Transparent**

**Key Properties:  
-Special PCT  
requirements**

**Applications:**

- Motor Insulation
- Transformer Tubing
- Electronics
- Protective overlay

Thickness ( $\mu$ )	Mechanical Properties				Haze %	Pressure cooker 121°C @ 2 bar			
	MDTS (kg/cm <sup>2</sup> )	TDTS (kg/cm <sup>2</sup> )	MDEL %	TDEL %		32Hrs MDEL %	32 Hrs TDEL %	36 Hrs MDEL %	36 hrs TDEL %
250	1900	2100	150	140	80	75	60	60	50
190	1900	2100	150	140	75	75	60	65	60
125	1800	2100	140	130	55	75	65	70	65
100	1800	2100	140	130	45	80	75	75	70
75	1800	2100	140	130	40	80	75	75	70
50	1800	2100	130	120	35	85	80	80	75
36	1800	2100	130	120	30	85	80	80	75

A488 provides the electrical industry with unique design and construction options due to the outstanding balance of its electrical properties in combination with chemical, thermal and physical properties. The polyester film is characterized by its excellent resistance to moisture and common solvents. It can be used at temperatures of -70 °C to 150 °C.



# Film for Photographic Printing Plates

JBF is a leading producer of PET Films for the printing plate industry

**Grade : A600**

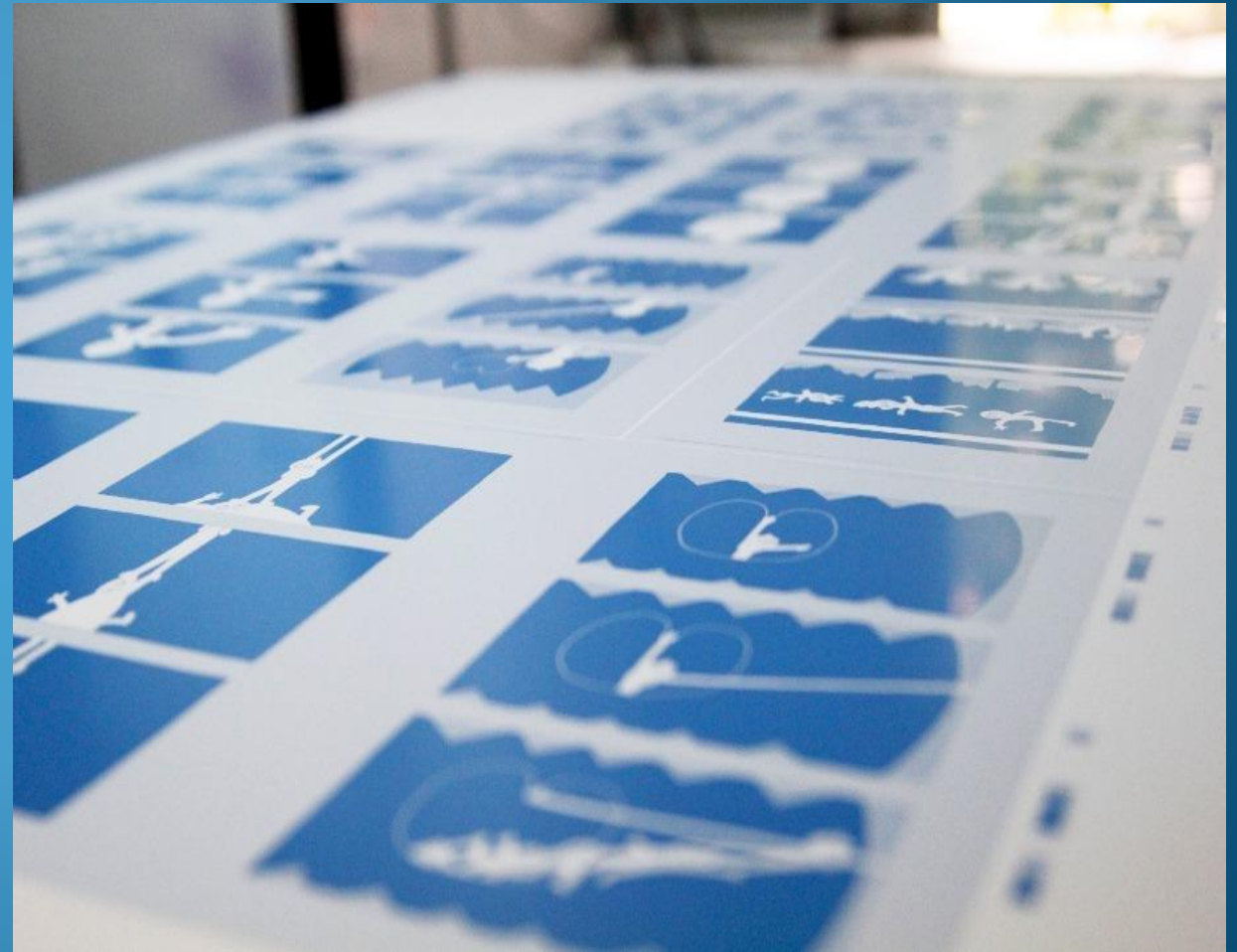
**Thickness range : 50mic to 150mic**

**Type of film: Milky White**

**Key Properties:**

**Special surface properties**

**Special Shrinkage requirements**



# MINING APPLICATION

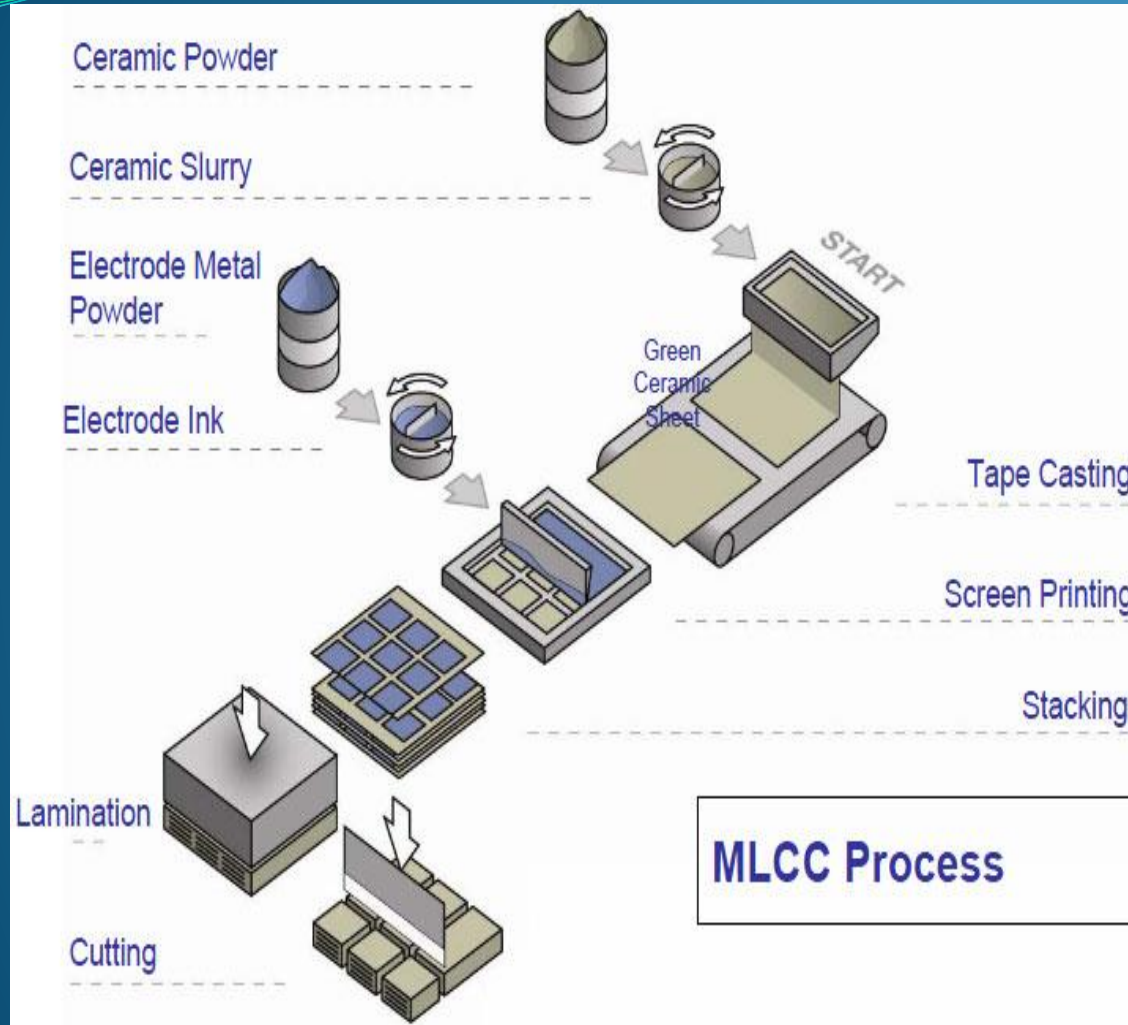
A480 grade Thick PET films are used in Mining applications . Explosives is packed in the PET film and then sealed .



987		Technical Data Sheet ARYAPET - A480			ARYA PET	
ARYAPET A480 is plain polyester film suitable for Mining application.						
Sr.No.	Properties	Unit	Test Method	Typical Values		
<b>General</b>						
1	Thickness	Micron (Gauge)	JBF Method	36 (144)	50 (200)	
2	Yield	M <sup>2</sup> /Kg	JBF Method	19.84	14.29	
3	Density	gm/cc	ASTM D 1505	1.4	1.4	
<b>Mechanical</b>						
1	Tensile Strength at break	MD	Kg/cm <sup>2</sup> (Kpsi)	ASTM D 882	2000 (28.4)	1900 (27.0)
		TD			2100 (29.8)	2000 (28.4)
2	Elongation at break	MD	%	ASTM D 882	130	130
		TD			120	120
3	Co-efficient of friction	Static	--	ASTM D1894	0.50	0.45
		Dynamic			0.45	0.40
<b>Thermal</b>						
1	Shrinkage @ 150° C/30'	MD	%	ASTM D1204	2.5	1.8
		TD			2.5	1.8
2	Melting Point	°C	DSC	255	255	
<b>Optical</b>						
1	Haze	%	ASTM D 1003	5.0	7.0	
<b>Surface treatment level</b>						
1	Both side	Dynes/cm	ASTM D 2578	44	44	



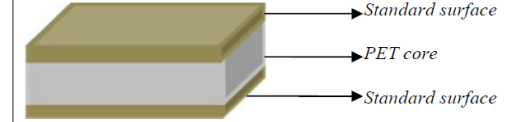
# MLCC – Multilayer Ceramic Capacitor



**Technical Data Sheet**  
**ARYAPET – A360**  
 (Provisional)



ARYAPET A360 is low surface roughness Hazy film suitable for MLCC, Release & other Industrial application.



Sr.No	Properties	Unit	Test Method	Typical Values	
<b>General</b>					
1	Thickness	Micron Gauge	JBF Method	25 100	
2	Yield	M <sup>2</sup> /Kg	JBF Method	28.57	
3	Density	gm/cc	ASTM D 1505	1.4	
<b>Mechanical</b>					
1	Tensile Strength at break	MD	Kg/cm <sup>2</sup> (Kpsi)	ASTM D 882	2100 (29.8)
		TD			2200 (31.2)
2	Elongation at break	MD	%	ASTM D 882	170
		TD			130
3	Co-efficient of friction	Static	--	ASTM D 1894	0.40
		Dynamic			0.35
<b>Thermal</b>					
1	Shrinkage @150°C/30'	MD	%	ASTM D 1204	1.6
		TD			0.4
2	Melting Point	°C	DSC	255	
<b>Optical</b>					
1	Haze	%	ASTM D 1003	10	
<b>Surface Roughness</b>					
1	Surface Roughness (Ra)	µm	JBF Method	0.012	



# Thick films for Graphic , Thermal lamination , Archives

BOX Window Films

GRAPHIC Imaging Film  
IMR

ARCHIVAL Film

THERMAL Lamination – Balanced  
Shrinkage Films

PHOTO Album

MONTAGE

LABELS

FACESHIELD



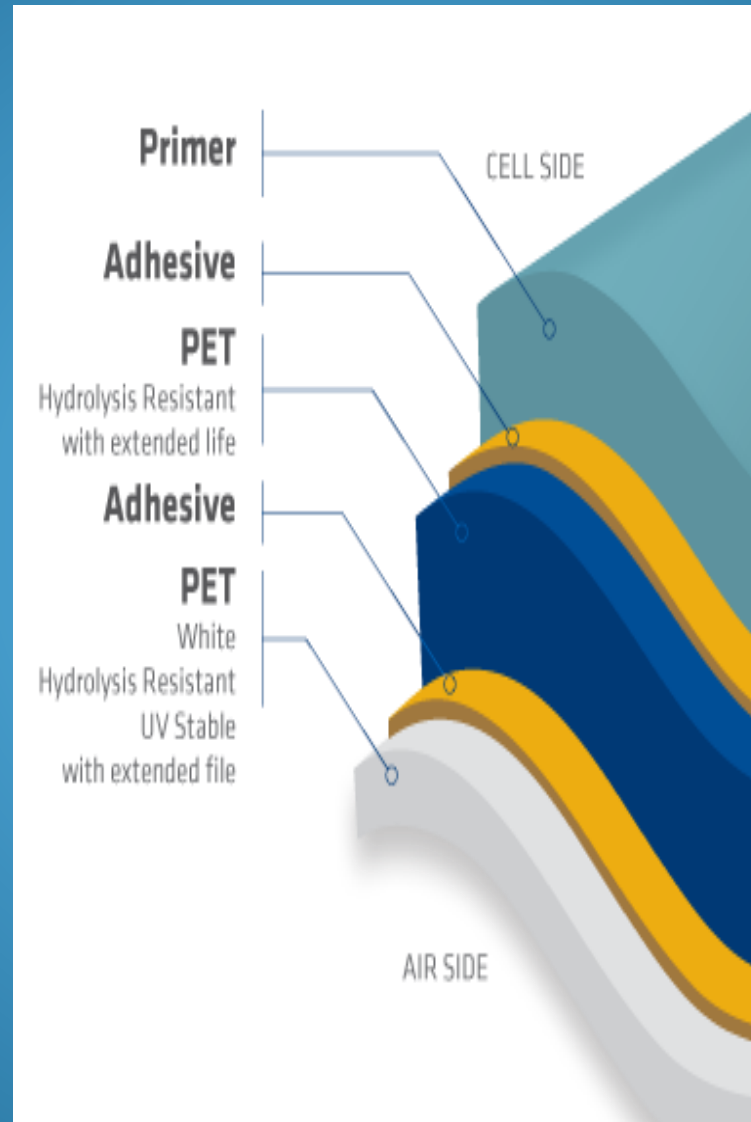
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# Photovoltaic ( PV) Backsheet

JBF is one of the largest supplier of PET film for PV back sheet globally .

JBF Can offer Hazy and white films to meet the varying PCT conditions .

Thickness range: 50mic to 250mic



# Matte ( A490 ) & Matte Metalized ( AM490 )

Type: A490, AM 490 & A390

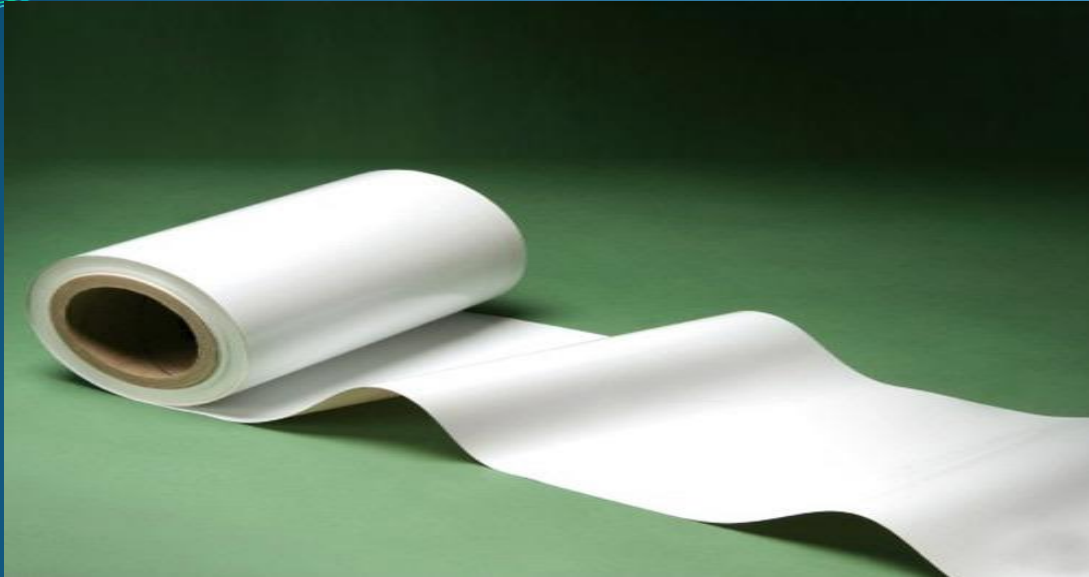
- Treatment :Corona/Chemical/Metalized
- Thickness – 12 to 125mic

Application:

- Labels & Laminates
- Release applications



# White PET Films



Properties	Unit	Test Method	Typical Values	
Thickness	Micron	JBF	36	50
Yield	M <sup>2</sup> /Kg	JBF	19.7	14.3
Whiteness Index	%	ASTM D 313	>100	>100
Transmittance	%	ASTM D 1003	20	15
Gloss @45°	--	ASTM D 2457	40	40

- **Thickness:** 36 to 125mic
- **Type:** A66o
- **Treatment :** Corona/Chemical one or both side
- **Application:** Release Liner, Labels , Graphics



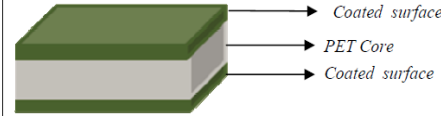
# Anti Fog Coated PET Films

A173 for Food Tray applications  
AF174 for Face shield and Eye  
Cover s



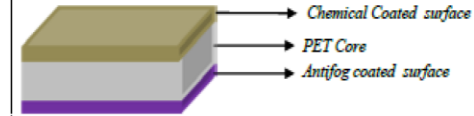
**Technical Data Sheet**  
**ARYAPET - AF174**  
*(Provisional)*

ARYAPET AF174 Super Clear foil both side coated with Anti-Fog properties after repeated cleaning with water suitable for Surgical Medical Mask and Other Application.



**Technical Data Sheet**  
**ARYAPET - A173**  
*(Provisional)*

ARYAPET A173 Super Clear film One side chemical coated and other side Anti-Fog coated with suitable for food trays window packaging applications



Sr. No	Properties	Unit	Test Method	Typical Values				
<b>General</b>								
1	Thickness	Micron (Gauge)	JBF Method	50 (200)	75 (300)	100 (400)	125 (500)	
2	Yield	M <sup>2</sup> /Kg	JBF Method	14.30	9.52	7.14	5.71	
3	Density	gm/cc	ASTM D 1505	1.4	1.4	1.4	1.4	
<b>Mechanical</b>								
1	Tensile Strength at break	MD	Kg/cm <sup>2</sup> (kpsi )	ASTM D 882	1900 (27.0)	1800 (25.5)	1800 (25.5)	1800 (25.5)
		TD			2000 (28.4)	1900 (27.0)	1900 (27.0)	1900 (27.0)
2	Elongation at break	MD	%	ASTM D 882	110	110	120	120
		TD			100	100	110	110
3	Co-efficient of friction	Static	--	ASTM D 1894	0.35	0.35	0.35	0.35
		Dynamic			0.30	0.30	0.30	0.30
<b>Thermal</b>								
1	Shrinkage @ 150°C/30'	MD	%	ASTM D 1204	2.0	2.0	2.0	2.0
		TD			1.0	1.0	1.0	1.0
2	Melting Point		°C	DSC	255	255	255	255
<b>Optical</b>								
1	Haze		%	ASTM D 1003	1.0	1.0	1.2	1.2
2	Total Luminous Transmission		--	ASTM D 1003	91	91	91	91
<b>Surface</b>								
1	Surface Tension		Dynes/cm	ASTM D 2578	70+	70+	70+	70+
2	Anti fog Test		---	JBF Method	Pass			

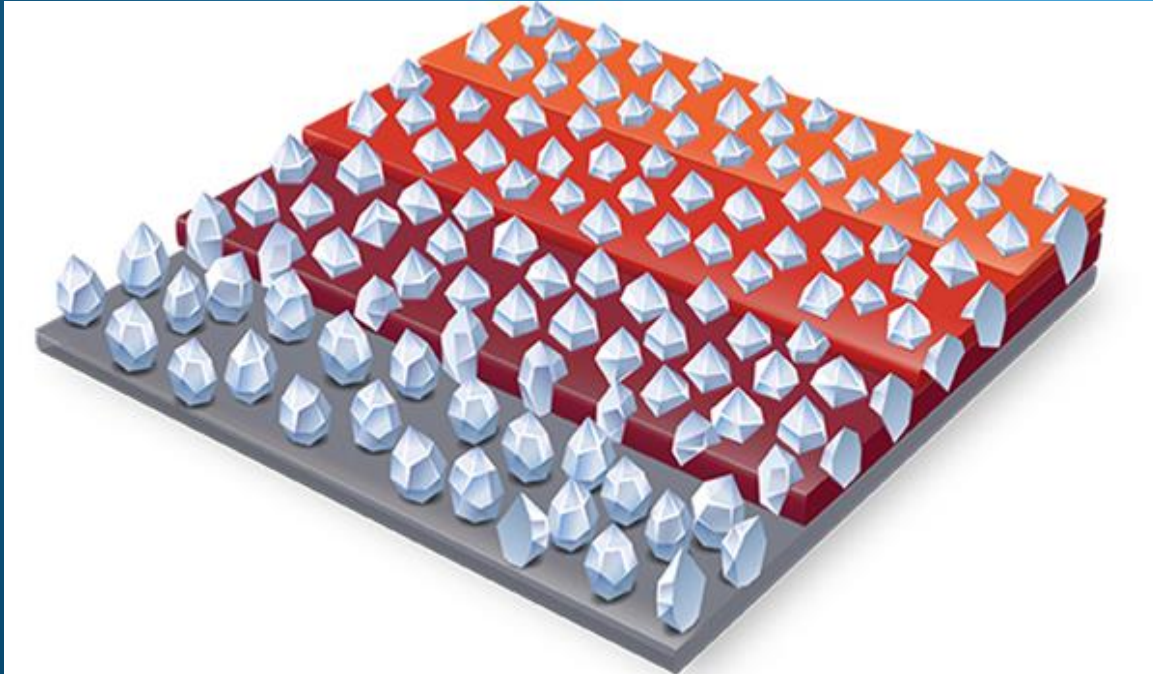
Sr. No	Properties	Unit	Test Method	Typical Values	
<b>General</b>					
1	Thickness	Micron (Gauge)	JBF Method	36 (144)	
2	Yield	M <sup>2</sup> /Kg	JBF Method	19.84	
3	Density	gm/cc	ASTM D 1505	1.4	
<b>Mechanical</b>					
1	Tensile Strength at break	MD	Kg/cm <sup>2</sup> (kpsi )	ASTM D 882	2000 (28.4)
		TD			2100 (29.8)
2	Elongation at break	MD	%	ASTM D 882	130
		TD			120
3	Co-efficient of friction	Static	--	ASTM D 1894	0.50
		Dynamic			0.45
<b>Thermal</b>					
1	Shrinkage @ 150°C/30'	MD	%	ASTM D 1204	1.6
		TD			0.4
2	Melting Point		°C	DSC	255
<b>Optical</b>					
1	Haze		%	ASTM D 1003	1.0
2	Total Luminous Transmission		--	ASTM D 1003	91
<b>Surface</b>					
1	Surface Tension		Dynes/cm	ASTM D 2578	56
2	Anti fog Test	Antifog	---	JBF Method	40
		Chemical			Pass





# Coating - Thick Chemical PET film

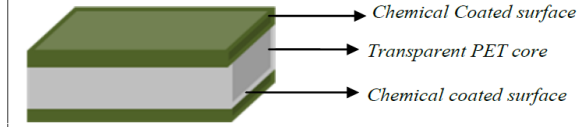
A430/A403 is suitable for Abrasive coating, Furniture Release, Specialty Coating, Digital & Inkjet Printing.



**Technical Data Sheet**  
**ARYAPET - A430**  
(Provisional)



**ARYAPET A430 Both side Chemical coated Polyester film suitable for Water base and Solvent base hard coatings.**



Sr.No.	Properties	Unit	Test Method	Typical Values					
<b>General</b>									
1	Thickness	Micron (Gauge)	JBF Method	36 (144)	50 (200)	75 (300)	100 (400)	125 (500)	
2	Yield	M <sup>2</sup> /Kg	JBF Method	19.84	14.29	9.52	7.14	5.71	
3	Density	gm/cc	ASTM D 1505	1.4	1.4	1.4	1.4	1.4	
<b>Mechanical</b>									
1	Tensile Strength at break	MD	Kg/cm <sup>2</sup> (Kpsi)	ASTM D 882	2000 (28.4)	1900 (27.0)	1900 (27.0)	1900 (27.0)	1800 (25.5)
		TD			2100 (29.8)	2000 (28.4)	2000 (28.4)	2000 (28.4)	1900 (27.0)
2	Elongation at break	MD	%	ASTM D 882	130	130	140	140	150
		TD			120	120	130	130	140
3	Co-efficient of friction	Static	--	ASTM D 1894	0.40	0.35	0.35	0.35	0.35
		Dynamic			0.35	0.30	0.30	0.30	0.30
<b>Thermal</b>									
1	Shrinkage @ 150° C/30'	MD	%	ASTM D 1204	1.6	1.6	1.4	1.4	1.4
		TD			0.4	0.4	0.4	0.4	0.4
2	Melting Point	°C	DSC	255	255	255	255	255	
<b>Optical</b>									
1	Haze	%	ASTM D 1003	6.0	7.0	8.0	9.0	11.0	
<b>Surface treatment level</b>									
1	Chemical coated side	Dyne/cm	ASTM D 2578	70	70	70	70	70	



**THANK YOU**

