

# METALLISED DIELECTRICS



Metallised Dielectrics for Today & Tomorrow

**MEHER**<sup>®</sup>  
ADVANCED MATERIALS

## INTRODUCTION

MEHER ADVANCED MATERIALS PVT LTD (MAM), established in 2009, is the Metallised Dielectrics Business Unit of the MEHER Group based in Bangalore, India.

MEHER's experience with Metallised Dielectric Film dates back to 1982 when it first designed and produced a range of Metallised Film Capacitors. Thus, there is a recognised record of understanding & contribution to the furthering of technology development in this area.

With this deep experience and state of the art Japanese technology & processes, MAM offers a comprehensive range of Metallised Thin & Ultra Thin Films to meet the various needs of Film Capacitor producers.

MAM Metallised films are used in Capacitors for Power Factor Correction, Electrical Appliances, Lighting, Fan Regulators, Energy Meters, Renewable Energy and Automotive applications.

MAM also focuses on the development of Specialised Metallised Films to suit unique Customer needs and applications of today and the future.

The experience & knowledge of the team and a strong emphasis on Product Quality is a key differentiator which adds to MAM's Value Proposition to it's Customers.

MAM is an ISO 9001 and ISO 14001 certified company & supplies Metallised Polypropylene and Metallised Polyester Films with RoHS compliance.

MAM's mission is to help it's Customers succeed and grow by providing the best Product Quality and Service.

While this catalogue broadly outlines the offer, the development of customised Metallised Film is also undertaken.

## MANUFACTURING FACILITIES

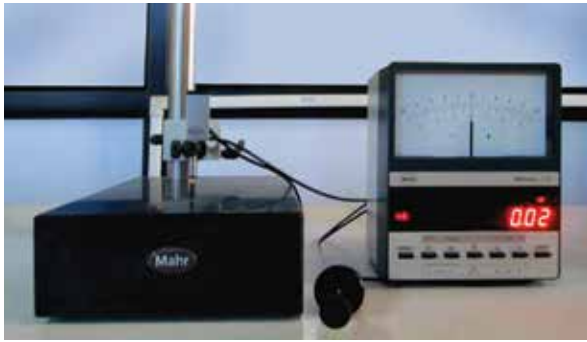


▲ ULVAC METALLISING MACHINES ▲

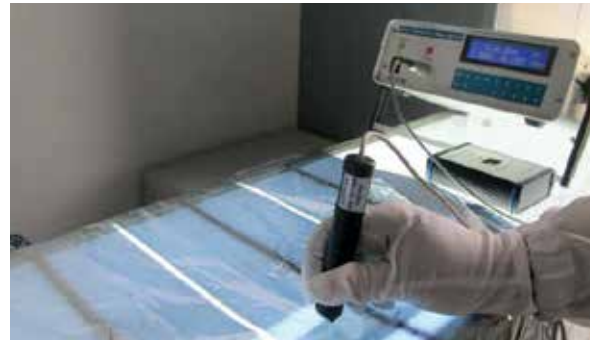


▲ VACOTEC SLITTING MACHINES ▲

## TESTING FACILITIES



▲ MILLITRON



▲ NAGY - 4 PIN RESISTIVITY METER



▲ PROFILE PROJECTOR



▲ INSULATION FAULT TESTER



▲ BREAKDOWN VOLTAGE TESTER



▲ CLIMATIC CHAMBER



▲ TEMPERATURE CHAMBER

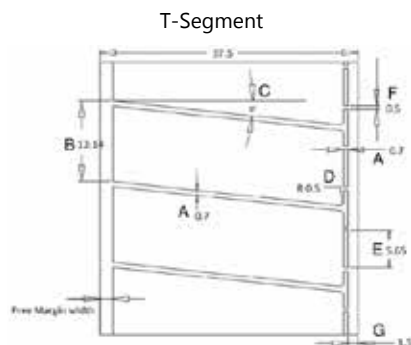
# GENERAL TECHNICAL PARAMETERS

## METALLISATION TYPE

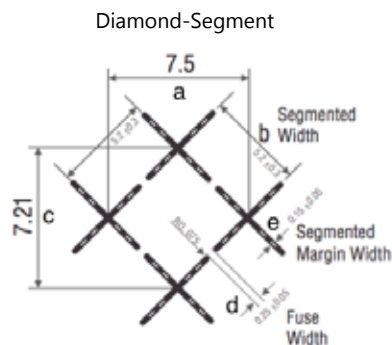
Code	Type of Metallisation	Profile	Resistance in $\Omega/\square$
Meherfilm FMF	Zinc-Alloy Flat Metallisation with Heavy Edge		HE: $\leq 3.0$ AA: $7.5 \pm 2.5$ or $11.0 \pm 2.5$
Meherfilm FMF2	Zinc-Alloy Extended Heavy Edge with Aluminium Active Area		Customer Specification
Meherfilm AMF	Aluminium Metallisation		Customer Specification
Meherfilm SMF	Zinc-Alloy Slope Metallisation		HE: 1.6 to 3.0 Slope: $2.0 \leq R2 \leq 3.4$ $14.0 \leq R1 \leq 20.0$
Meherfilm SRMF	Series Metallisation		Customer Specification
Meherfilm PMF	Segmented/ Pattern Metallisation	T – Segment      Diamond – Segment 	Customer Specification

Note: Other Profiles & Pattern designs can be made on request

## Standard PMF Specs



Mark	Specifications
A	$0.7 \pm 0.1$ mm
B	$12.14$ mm $\pm 5\%$
C	$6^\circ \pm 1^\circ$
D	$0.5 \pm 0.2$ mm
E	$5.65 \pm 0.1$ mm
F	$0.5 \pm 0.1$ mm
G	$1.5 \pm 0.2$ mm
Film Width	$37.5$ mm



Mark	Specifications
a	$7.5 \pm 0.1$ mm
b	$5.2 \pm 0.3$ mm
c	$7.21 \pm 0.1$ mm
d	$0.25 \pm 0.05$ mm
e	$0.15 \pm 0.05$ mm
Film Width	$50$ mm

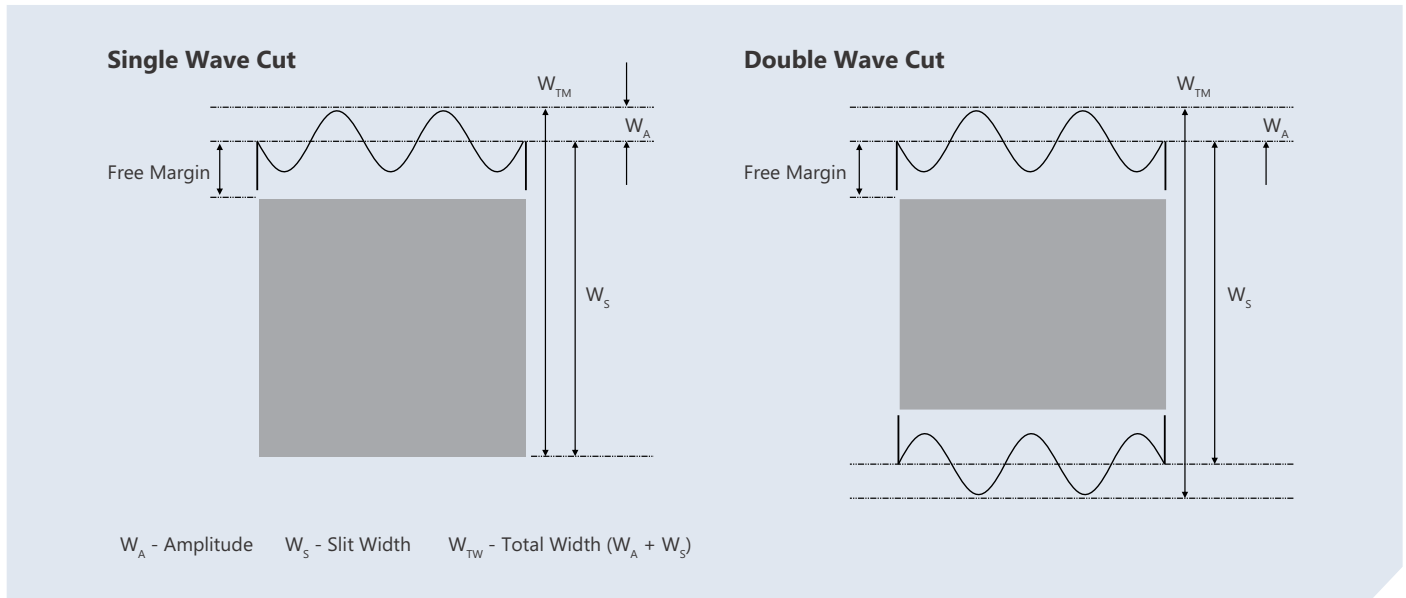
## METALLISED POLYPROPYLENE FILM

Thickness ( $\mu\text{m}$ )		Slit Width & Tolerance (mm)	Free Margin Width & Tolerance (mm)	Core Dimensions (mm)		Reel Outer Diameter & Tolerance (mm)
Nominal	Tolerance			Inner Diameter	Width Tolerance	
2.7	$\pm 5\%$	6.5 to 20 $\pm 0.20$ 21 to 50 $\pm 0.30$ 60 to 150 $\pm 0.40$	0.8 $\pm 0.10$ 1.0 $\pm 0.10$ 1.5 $\pm 0.15$ 2.0 $\pm 0.30$ 2.5 $\pm 0.40$ 3.0 $\pm 0.50$	76 $\pm 1$	$\pm 0.1$	Film Width <10 mm: 140 $\pm 10$ $\geq 10$ mm: 160 $\pm 10$ 20 mm: 180, 210, 240 + 10, - 20 $\geq 30$ mm: 240, 260, 290, 330 + 10, - 30
3.0						
4.0						
4.5						
5.0						
6.0						
6.5						
7.0						
7.5						
8.0						
9.0						

## METALLISED POLYESTER FILM

Thickness ( $\mu\text{m}$ )		Slit Width & Tolerance (mm)	Free Margin Width & Tolerance (mm)	Core Dimensions (mm)		Reel Outer Diameter & Tolerance (mm)
Nominal	Tolerance			Inner Diameter	Width Tolerance	
3.8	$\pm 5\%$	6.5 to 20 $\pm 0.20$ 21 to 50 $\pm 0.30$	0.8 $\pm 0.10$ 1.0 $\pm 0.10$ 1.5 $\pm 0.15$ 2.0 $\pm 0.30$ 2.5 $\pm 0.40$ 3.0 $\pm 0.50$	76 $\pm 1$	$\pm 0.1$	Film Width <10 mm: 140 $\pm 10$ $\geq 10$ mm: 160 $\pm 10$ 20 mm: 180, 210, 240 + 10, - 20 $\geq 30$ mm: 240, 260, 290, 330 + 10, - 30
4.0						
4.3						
4.6						
4.8						
5.6						
5.8						
6.8						

## WAVE CUT



Amplitude (Peak to Peak-2WA)		Wave		Remarks
2WA	Tolerance	Length	Tolerance	
0.30mm	±0.20mm	2.50mm	±1.50mm	Small Wave
0.80mm	±0.25mm	5.00mm	±2.00mm	Standard Wave

## TYPICAL BASE FILM DIELECTRIC PROPERTIES

Properties	Polypropylene (PP)	Polyester (PET)	Unit	Remarks
Density, $\rho$	0.905	1.4	$\text{g/cm}^3$	-
Dielectric constant, $\epsilon$	2.2	$3.2 \pm 0.3$	-	at 1 kHz 23°C
Loss factor, $\tan d$	< 0.0002	$\leq 0.006$	-	at 1 kHz 25°C
Water absorption	< 0.1%	< 0.05 %	-	within 24h at 20°C
Dielectric Strength / BDV	> 500	> 400	$\text{V}/\mu\text{m}$	-
Tensile strength ( MD )	> 130	>200	MPa	-
Tensile strength ( TD )	> 230	>210	MPa	-
Surface Roughness Ra- A/B Eg : $5\mu\text{m}$ Rmax – A/B	0.15 - 0.18 1.29 - 1.55	0.06 - 0.15	$\mu\text{m}$	-
Coefficient of friction A x B	0.7	< 0.7	$\mu\text{K}$	-
Shrinkage MD	< 5%	< 3 %	-	PP: At 120°C, 15 min PET: At 150°C , 30 min
Shrinkage TD	< 0.5 %	< 2 %	-	PP: At 120°C, 15 min PET: At 150°C , 30 min

MD: Machine Direction    TD: Transverse Direction    A: Inside    B: Outside

Note: Development of Customised Metallised Films is also undertaken

## QUALITY ASSURANCE

- ▶ MAM controls quality in selection of base film & other key production materials.
- ▶ During inward process, critical characteristics of materials are tested using internal & external test facilities.
- ▶ SPC, PFMEA, MSA and Quality Gates are followed in the process of Metallisation and Slitting in order to achieve reliable and consistent Metallised Film Quality.
- ▶ Metallised Film Reels undergo Routine and Special Tests using the latest in-house Testing Equipment and are vacuum packed with desiccants.

## RESEARCH & DEVELOPMENT CAPABILITIES

- ▶ MAM has a specialised Metallised Dielectrics Evaluation (MDE) Lab, which includes its own Ageing Test Set-Up.
- ▶ MAM's R&D Team conducts studies on Metallised films for various applications.
- ▶ Sample capacitors are carefully prepared and subjected to life tests.
- ▶ During life tests, performance is estimated with the combination of variation in thermal and voltage stresses in line with IEC and other international standards.

## ORDERING DATA TO BE PROVIDED

- ▶ Base Film Make & Grade
- ▶ Metallisation Type & Drawing
- ▶ Resistivity
- ▶ Thickness
- ▶ Slit Width
- ▶ Free Margin Width
- ▶ Slit Reel Inner & Outer Diameter
- ▶ Straight Cut or Wave Cut @ FM / HE
- ▶ Quantity in Kgs

## PACKING

- ▶ Equal number of reels with left and right margin are stacked using plastic foam for the protection on the metal reinforced (non free margin) side.
- ▶ These reels are packed in polythene bags and placed in aluminum foil laminated opaque bags. After inserting desiccant packets inside, the foil bags are vacuum sealed.
- ▶ The bags are then packed in an inner and an outer carton made of tough corrugated board to ensure safe delivery and storage.

## LABELLING

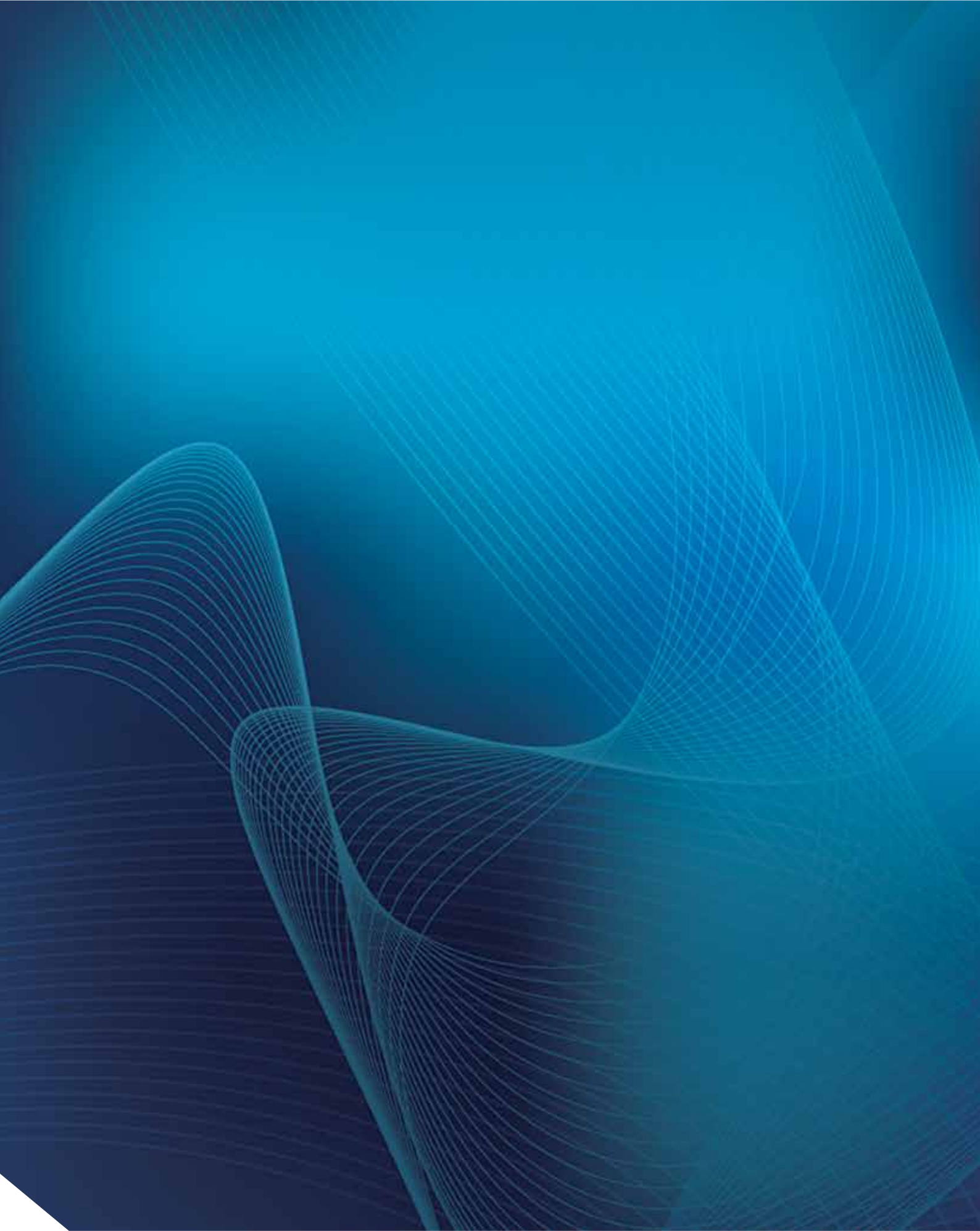
- ▶ Core Label: Contains details of Metallisation Type, Base Film, Thickness, Slit Width, Free Margin Width, Batch and Reel number.
- ▶ Bag & Carton Box Label: Contains Metallisation Type, Base Film, Thickness, Slit Width, Free Margin Width, Batch number, Bag/Box number, Number of pairs, Number of Joints, Outer Diameter, Date of Production and Quantity in Kgs.

## TEST REPORT

- ▶ A Test Report furnishing specification values and actual values of desired parameters is given for each batch of supply.

## STORAGE AND WARRANTY CONDITION

- ▶ All types of Metallised Films supplied by MAM should be stored in original packing and kept away from direct sunlight.
- ▶ Recommended Temperature and Humidity: 15-25°C and < 65 % RH respectively.
- ▶ Caution: Thin metallised layer is likely to be easily oxidised in the presence of moisture. The material should be used as soon as possible on opening of vacuum sealed bag.
- ▶ MAM guarantees the quality of all types of Metallised Films supplied for 6 Months following the shipment date, provided it is in the original packing and stored as described above.
- ▶ Shipping & transit damage of the packed material to be covered under separate agreement / claims.



**MEHER ADVANCED MATERIALS PVT LTD**

# 16(K) 1, Attibele Industrial Area, Bangalore – 562107, INDIA

Sales Contact: +91 94496 53027 | E-mail: [advanced.materials@meher.com](mailto:advanced.materials@meher.com)

Company Website: [www.meher-am.com](http://www.meher-am.com) | Group Website: [www.meher.com](http://www.meher.com)

