



**PRODUCT DATA**

**KRYSTALFLEX PE 393**

**Thermoplastic Polyurethane Film**

**INTRODUCTION**

KRYSTALFLEX PE393 is a high performance aliphatic polyether film intended for processing by lamination into range of glass / polycarbonate components.

KRYSTALFLEX PE393 is part of the HUNTSMAN optical aliphatic film range for glass, polycarbonate, CAB lamination applications and can be used in aerospace, transportation, security and architectural applications.

**PERFORMANCE FEATURES**

- Excellent laminated transparency
- Excellent hydrolysis & microbial resistance
- Good low temperature flexibility
- Enhanced UV stability
- Medium durometer
- Low modulus
- Contains adhesion promoter

**APPLICATIONS**

- Large , curved , and asymmetrical laminations
- Prison containment glazing
- Ballistic / Blast / Intrusion
- Vehicle armoring
- Hurricane / Vandal glazing
- Retail kiosks
- Liquid crystal laminates
- Computer screens

**Table 1: Typical Physical Properties**

Property	Key	DIN	Unit	Value	ASTM	Unit	Value
Hardness	M	53505	Shore A	74	D-2240	Shore A	74
Tensile Strength	E	53504	MPa	21	D-412	psi	3000
Elongation @ break	E	53504	%	600	D-412	%	600
100% Modulus	E	53504	MPa	3	D-412	psi	400
300% Modulus	E	53504	MPa	7	D-412	psi	800
Tear Resistance	E	53515	N/mm	52	D-624	pli	300
Specific Gravity	E	53478		1.05	D-792		1.05
Softening Range Low	E	Huntsman TMA	°C	85	Huntsman TMA	°F	185
Softening Range High	E	Huntsman TMA	°C	120	Huntsman TMA	°F	250
Peak Temperature	E	Huntsman TMA	°C	106	Huntsman TMA	°F	223
Tg (mid point)	E	Huntsman TMA	°C	-44	D-3418	°F	-44

E= 0.050" extruded film cut to ASTM requirements  
M = Injection moulded parts to meet DIN & ASTM requirements.  
ASTM measurements were made at 20 in/min  
DIN measurements were made at 500 mm/min





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#### POLYMER SELECTION

Before selecting this product it is necessary that the user ensures the product performance will meet all operational and end use requirements. Having satisfied these requirements, should changes be contemplated in method of application, materials, service conditions or any other change that could affect the ultimate performance of the end product, then further tests and trials should be carried out. For assistance with particular problems and applications, please contact the HUNTSMAN TPU Technical Service Department listed below.

#### HEALTH & SAFETY ADVICE

Before undertaking any trials with this product it is essential that all personnel are aware of the necessary precautions that must be taken. These are detailed in the relevant Material Safety Data Sheet, which will be provided by HUNTSMAN.

#### SUPPLY & STORAGE

KRYSTALFLEX PE393 is supplied in the form of film with interlayer in cardboard boxes.

KRYSTALFLEX PE393 may be stored for 24 months from the date of manufacture, sealed in the manufacturer's original packaging.

#### PHYSICAL FORM

Type: Film

#### MATERIAL PREPARATION

To ensure trouble free processing, it is necessary to keep KRYSTALFLEX film free of dust or contamination.

For further advice on the use of KRYSTALFLEX film, please contact the HUNTSMAN TPU Technical Service Department at any of the addresses listed below.

#### PROCESSING PARAMETERS

Table 2: Typical Lamination Parameters

Ultimate Temperature:	90°C – 110°C 194°F – 230°F
Ultimate Pressure:	8 bar – 12 bar 116 psi – 174 psi
Soaking Time:	30 min. per 6 mm 30 min. per 0.25 inch

The address of your nearest technical centre is:

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