

# AVALON<sup>®</sup> 90AB

## Thermoplastic Polyurethane

(Preliminary Product Data Sheet)

AVALON<sup>®</sup> 90AB is a high performance polyester based thermoplastic polyurethane for injection molding.

All AVALON<sup>®</sup> B grades are recommended in applications requiring:

- Excellent physical properties
- Good hydrolytic stability
- Oil, fuel and grease resistance
- Good processing characteristics
- Abrasion Resistance
- Low temperature flexibility

AVALON<sup>®</sup> 90AB grade is used in specialty footwear applications such as sports soles.

**TABLE 1: TYPICAL PHYSICAL PROPERTIES**

<u>Property</u>	<u>Method</u>	<u>Units</u>	<u>Value</u>
Density	ISO 2781	g/cm <sup>3</sup>	1.22
	ASTM D792	pcf	76
Hardness, Shore A	ISO 868	A	90
	ASTM D2240		
Hardness, Shore D	ISO 868	D	44
	ASTM D2240		
Tensile Strength	ISO 37	Mpa	37
	ASTM D412	psi	5400
Elongation at Break	ISO 37	%	525
	ASTM D412		
100% Modulus	ISO 37	Mpa	8
	ASTM D412	psi	1100
300% Modulus	ISO 37	Mpa	16
	ASTM D412	psi	2200
Tear Strength (Angle)	ISO 34B	N/mm	122
	ASTM D624	lb/in	700
Taber Abrasion (H-18)	ASTM D1044	mg	75
Rebound Resilience	ISO 4662	%	45
Ross Flex @ -10 <sup>0</sup> C (-14°F)	BS 5131	cycles	>250 k
Tensile retention, 21 days @ 80°C	ISO 37	%	> 90

### 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. The Safety and Health Advice in this bulletin is summarized and may not contain sufficient details for safe handling in all cases. For detailed information refer to the **Material Safety Data Sheet** provided for this product.

### POLYMER SELECTION

Before selecting this product it is necessary that the user ensures its 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 AVALON<sup>®</sup> TPU Technical Service Department.

### PACKAGING & STORAGE

AVALON<sup>®</sup> TPU is supplied pre-dried in 25 Kg (55 lb) moisture guarded sacks, 40 per pallet and shrink wrapped.

AVALON<sup>®</sup> TPU may be stored for up to 24 months from the date of manufacture, sealed in the manufacturers original packaging.

### MATERIAL PREPARATION

To ensure trouble-free processing and high quality injection molded parts, it is preferable to dry all AVALON<sup>®</sup> TPU grades. The recommended drying conditions are 2 hours at 80-90°C (175-195°F) in a dessicant dryer.

For specific advice on coloring AVALON<sup>®</sup> TPU grades, the use of additives and regrind, please contact the AVALON<sup>®</sup> TPU Technical Service group.

**SCREW DESIGN**

Injection molding machines with general purpose polyethylene-type, 3 stage screws, are most suitable for processing AVALON® TPU grades.

High shear screws with mixing pins, nylon-type screws or short compression stage screws are not recommended.

The most suitable configuration is listed in Table 2.

**MOLD CONSIDERATIONS**

To avoid shear degradation the runner system should be as generous as possible with a full round/circular or trapezoid section offering the best results.

Gating should be as large as possible with a relatively short length to ensure maximum transference of holding pressure. Most designs are appropriate with the exception of submarine and pin gating.

Mold cavities with a vapor basted finish will improve demolding.

Standard venting techniques should be employed to eliminate air trapping and burn marks.

The address of your nearest center and sales office is:

**Huntsman Polyurethanes**  
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<b>TABLE 2: TYPICAL PROCESSING PARAMETERS</b>	
Typical Screw Diameter	40 - 120 mm
L/D Ratio	20:1 to 25:1
Compression Ratio	2:1 to 3:1
3 Stage Design (length = L)	
Feed Zone	0.4 x L
Compression Zone	0.3 x L
Metering Zone	0.3 x L
Screw Rotation Speed	20 - 80 rpm
Injection Pressure	20 – 100 Bar (6000-15000 psi)
Secondary or Holding Pressure	10 – 50 Bar (1500 – 7500 psi)
Back Pressure	0.3 – 3 Bar (5 – 50 psi)
Injection Speed	As slow as possible
Mold Temperature	27 – 50°C (80 – 120°F)
Temperature Profile -	
Feed Zone	25 – 35 °C (75 – 95 °F)
Rear Zone	195 - 205 °C (380 - 400°F)
Center Zone	200 - 210 °C (390 - 410°F)
Front Zone	205 - 215 °C (400 - 420 °F)
Nozzle Tip	200 - 210 °C (390 -410 °F)

**For Your Protection**

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