



PRODUCT DATA

AVALON® 90 AE

Thermoplastic Polyurethane

INTRODUCTION

AVALON 90 AE is a high performance polyester based thermoplastic polyurethane for injection moulding.

AVALON 90 AE is part of the AVALON Perform Range and offers a premium soling material for sports footwear.

The features offered include :

- Durability
- Excellent surface definition
- Abrasion resistance
- Flex resistance
- Phthalate free TPU

Table 1: Typical Physical Properties ⁽¹⁾

Property	Method	Unit	Value
Density	SIN 53479	g/cm ³	1.23
Hardness, Shore A	DIN 53505	A	90
Hardness, Shore D	DIN 53505	D	44
Tensile Strength	DIN 53504	MPa	30
Elongation at Break	DIN 53504	%	450
100% Modulus	DIN 53504	MPa	7
300% Modulus	DIN 53504	MPa	12
Tear Strength (Angle)	DIN 53515	kN/m	105
Compression Set @ 23°C	DIN 53517	%	20
Abrasion Resistance	DIN 53516	mm ³	35
Ross Flex @ -10°C	BS 5131	k.cycles	250

⁽¹⁾ : Test plates conditioned 20 hours at 100°C before testing.

HEALTH AND 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 Safety Data Sheet that will be provided by Huntsman Polyurethanes.

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 TPU Technical Service Department.

PACKAGING & STORAGE

AVALON TPU is supplied in 20 or 25 kg moisture guarded sacks, 40 per pallet and shrink wrapped.

AVALON Thermoplastic Polyurethanes may be stored for 24 months from the date of manufacture, sealed in the manufacturers original packaging.



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MATERIAL PREPARATION

AVALON TPU grades are supplied pre dried in moisture guarded sacks.

To ensure trouble free processing and high quality injection moulded parts, it is preferable to dry AVALON TPU grades.

The recommended drying conditions are 2hrs at 80-90°C in a desiccant dryer.

For specific advice on colouring AVALON TPU grades, the use of additives and regrind, please contact the AVALON TPU Technical Service group.

SCREW DESIGN

Injection moulding 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.

MOULD 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.

Mould cavities with a sand blasted finish will improve demoulding.

However polished moulds give best transparency properties.

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

Enquiries should be addressed to the nearest Huntsman Sales Office or to:
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Table 2: Typical Processing Parameters

Typical Screw Diameter	40 – 120 mm
L/D Ratio	20 – 25 :1
Compression ratio	2.0 – 3.0 :1
3 Stage Design	
Feed Zone	0.4L
Compression Zone	0.3L
Metering Zone	0.3L
Screw rotation speed	20 – 80 rpm
Injection pressure	20 – 100 Bar
Secondary or holding pressure	10 – 50 Bar
Back pressure	0.3 – 3 Bar
Injection speed	As slow as possible
Mould temperature	25 – 50°C
Temperature profile:	
Feed Zone	25 – 35°C
Rear Zone	185 – 195°C
Centre Zone	190 – 200°C
Front Zone	195 – 205°C
Nozzle Tip	180 – 190°C