



PRODUCT DATA

AVALON 80 AE

Thermoplastic Polyurethane

INTRODUCTION

Avalon 80 AE is a high performance polyester based thermoplastic polyurethane for injection moulding.

Avalon 80 AE is part of the Avalon Perform Range and offers a premium soling material for sports and protective footwear.

The benefits offered are :

- Durability
- Excellent surface definition
- Abrasion resistance
- Flex resistance

| Table 1: Typical Processing Properties | | | |
|--|----------|-------------------|-------|
| Property | Method | Unit | Value |
| Density | ISO 2781 | g/cm ³ | 1.22 |
| Hardness, Shore A (cured) | ISO 868 | A | 80 |
| Hardness, Shore D | ISO 868 | D | 30 |
| Tensile Strength | ISO 37 | MPa | 26 |
| Elongation at Break | ISO 37 | % | 600 |
| 100% Modulus | ISO 37 | MPa | 5 |
| 300% Modulus | ISO 37 | MPa | 8 |
| Tear Strength (Angle) | ISO 34B | kN/M | 80 |
| Compression Set @23°C | ISO 815 | % | 13 |
| Abrasion Resistance | ISO 4649 | Mm3 | 35 |
| Ross Flex @ -10°C | BS 5131 | - | >250k |

NE = Not Evaluated

NA = Not Applicable

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 which will be provided by Huntsman Polyurethanes

POLYMER SELECTION

Before selecting this product it is necessary that the user ensures it's 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.

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

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 | 26 - 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 |

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