



Roamr

TPU Air HR 85A

Noir

Beige

Roamr TPU Air HR 85A is a structural High Rebound foaming TPU within the Roamr series, specifically engineered for high-stress, high-wear, and critical support zones in footwear.

Unlike materials that chase extreme hardness, HR 85A strikes the perfect balance between stable support, responsive rebound, and long-term durability.

Ideal for:

- Outsoles & High-Wear Zones
- Ergonomic Slides
- Structural Midsoles
- Reinforced Uppers

Mechanical Properties

| Specification | Value |
|------------------------------------|-------------------------|
| Name | Roamr TPU Air HR 85A |
| Net Weight | 800g Spool |
| Diameter | 1.75mm (± 0.03 mm) |
| Filament Density g/cm ³ | 1.05 g/cm ³ |
| Melt Index (MFI) | 8 g/10min |

The following properties were measured on specimens printed under controlled conditions*.

Properties vary significantly based on print temperature due to the active foaming mechanism. Since Roamr TPU Air HR foams differently with 0.4mm and 0.6mm, where 0.4mm is more commonly used and 0.6mm foaming easier. We are presenting two sets of tables.

Properties at 0.4mm Nozzle

| Properties | Sample 1 | Sample 2 | Sample 3 | Sample 4 | Method |
|------------------------------|------------------------|------------------------|------------------------|------------------------|------------|
| Print Temp | 230°C | 240°C | 250°C | 260°C | - |
| Flow Rate | 93 % | 83 % | 72 % | 62 % | - |
| Printed Part Density | 0.93 g/cm ³ | 0.83 g/cm ³ | 0.72 g/cm ³ | 0.62 g/cm ³ | ISO 845 |
| Hardness | 83 A | 82 A | 76 A | 70 A | ISO 7619 |
| Tensile Yield Strength (X-Y) | 12.5 MPa | 11 MPa | 7 MPa | 5.3 MPa | ISO 527 |
| Elongation at Break (X-Y) | 750 % | 680 % | 620 % | 550 % | ISO 527 |
| Bayshore Rebound | 48 % | 48 % | 48 % | 48 % | ASTM D2632 |

Mechanical Properties

Properties At 0.6mm Nozzle

| Mechanical Properties | Sample 1 | Sample 2 | Sample 3 | Sample 4 | Method |
|------------------------------|------------------------|------------------------|------------------------|------------------------|------------|
| Print Temp | 220°C | 230°C | 240°C | 250°C | - |
| Flow Rate | 84 % | 74 % | 65 % | 55 % | - |
| Printed Part Density | 0.84 g/cm ³ | 0.74 g/cm ³ | 0.65 g/cm ³ | 0.55 g/cm ³ | ISO 845 |
| Hardness | 85 A | 78 A | 72 A | 68 A | ISO 7619 |
| Tensile Yield Strength (X-Y) | 11.7 MPa | 9 MPa | 6.2 MPa | 4.5 MPa | ISO 527 |
| Elongation at Break (X-Y) | 710 % | 640 % | 600 % | 500 % | ISO 527 |
| Bayshore Rebound | 48 % | 48 % | 48 % | 48 % | ASTM D2632 |

* The flow rate percentage is directly proportional to the final printed part density; for example, a 80% flow rate will result in an approximate density of 0.8 g/cm³.

*Specimens printed under the following conditions: Nozzle size 0.4mm / 0.6mm, Bed temp 45°C, Print speed 60mm/s, Infill 100%, Infill angle ±45°.

Flow rate adjusted per temperature for optimal foaming.

Preparing for Printing

| | |
|---------------------------|---|
| Drying | 70–80°C for 4-6 hours |
| Nozzle Diameter | 0.4mm–0.8mm |
| Nozzle Material | Brass nozzles will work, but hardened steel or higher grade nozzles are recommended |
| Recommended Build Surface | Glass (w/ PVP glue), PEI (w/ release agent), Steel Plate (w/ PVP glue), PC Film |
| Enclosure | No requirement |

Work Flow

Printing with Roamr TPU Air HR 85A

For best results, it is recommended to print directly from a dry box or filament dryer, maintaining humidity below 15%.

| | |
|-----------------------------|---------------------------------|
| Nozzle Temperature | 220–260°C |
| Build Plate Temperature | 35–50°C |
| Cooling Fan Speed | 100 |
| Print Speed | 30–60mm/s |
| Flow Rate / Extrusion Mult. | See Table Above for Each Nozzle |
| Retraction Distance | Off Recommended |
| Retraction Speed | Off Recommended |

Moisture Management

| Storage Tip | Recommendation |
|-----------------------|--|
| Sealed Packaging | Store in a sealed aluminum foil bag to prevent moisture. |
| Use Desiccants | Add desiccants to absorb moisture and keep the material dry. |
| Avoid Sunlight & Heat | Keep away from direct sunlight and high temperatures to prevent degradation. |
| Temperature Control | Store at room temperature; avoid extreme heat or cold. |