**4.11 Table 11 - Extruded Filament Length at Varying Speeds**

**Data**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| MELT | DRIVE | DIAMETER | ORIFICE | MATERIAL | TEMP | LENGTH |
| Volcano | Direct | 1.75 mm | 1.2 mm | ABS | 250 C | 50 mm |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Volume Flow Rate (mm3/min)** | **Speed**  **(mm2/min)** | **Trial 1**  **(mm)** | **Trial 2**  **(mm)** | **Trial 3**  **(mm)** | **Average**  **(mm)** |
| **200** | 83 | 49.97 | 50.01 | 49.99 | 49.99 |
| **400** | 166 | 50.04 | 49.97 | 49.98 | 50.00 |
| **600** | 249 | 49.79 | 49.81 | 49.85 | 49.82 |
| **800** | 333 | 49.68 | 49.68 | 49.71 | 49.69 |
| **1000** | 416 | 49.69 | 49.52 | 49.31 | 49.51 |
| **1200** | 499 | 49.00 | 49.23 | 48.75 | 48.99 |
| **1400** | 582 | 48.46 | 48.65 | 48.45 | 48.52 |
| **1600** | 665 | 48.57 | 48.51 | 48.39 | 48.49 |
| **1800** | 748 | 48.23 | 48.32 | 48.28 | 48.28 |
| **2000** | 832 | 46.87 | 47.21 | 47.01 | 47.03 |
| **2200** | 915 | 45.70 | 46.16 | 45.98 | 45.95 |
| **2400** | 998 | 43.73 | 42.31 | 44.69 | 43.58 |
| **2600** | 1081 | 38.58 | 35.21 | 37.64 | 37.14 |
| **2800** | 1164 | 20.13 | 18.76 | 24.04 | 20.98 |
| **3000** | X | X | X | X | X |

**Observations:**

* 2400 flow: grinding noise, 1 “click”
* 2600 flow: grinding noise, 2 clicks
* 2800 flow: grinding noise, several clicks

**Specifications:**

* Octave 1.75mm ABS Yellow
* Printrbot Alu-Extruder, direct gear drive

**Failure Mode:**  Extrusion thickening

**Analysis:**

Text here