

# Product Specification Sheet

Luvocom 3F PAHT KK 50056 BK FR

Date of issue: 04-02-2025 / Date of update: 04-02-2025



## Product specifications

Luvocom 3F PAHT KK 50056 BK FR filament is a PA6 filament filled with ceramic microspheres. It has the highest flame retardant rating and produces low smoke. By that, this filament complies with the fire behavior norms for the railway industry.

- UL-94 V-0 flame retardant rating
- EN 45545 (fire behavior of materials in trains)
  - ISO 4589-2 OI (oxygen Index) R22 + R23 - HL1, HL2, HL3
  - ISO 5659-2 Ds (smoke density) R22 + R23 - HL3

Printed parts are stiff, strong, and temperature resistant up to 160°C.

Your parts can operate in high temperature conditions and resist high temperature fluctuations.

Luvocom 3F PAHT KK 50056 BK FR is an excellent material for electrical insulation.

## Important key features

- UL-94 V-0 flame retardant rating
- Complies with EN 45545 fire behavior norms for trains
- Heat resistant up to 160 °C.
- Electrical insulator.
- Halogen free

## Suitable applications

- High performance end-use parts.
- Replacement parts in trains.
- Applications that require fire resistance.
- Printing electrical insulating parts.
- Small scale productions.

## Recommended print settings

**Nozzle temp:** ± 270 - 300°C

**Print speed:** ± 30 - 70 mm/s

**Drying:** ≥12 hours at 80°C

**Experience level:** Expert

**Heat bed:** ± 90 - 110°C

**Nozzle:** ≥ 0.5mm

**Drybox:** Recommended

**Fan speed:** ± 0 - 25%

**Buildplate adhesion:** EasyFix Nr. VI

**Enclosure:** Recommended

## Material properties

Specific gravity

Water absorption (23°C / 24h)

Linear mould shrinkage

## Typical value

1.49 g/cm<sup>3</sup>

<0,3%

0,0-0,1%

## Test Method

ISO 1183-3

ISO 62

DIN 16742

## Mechanical properties at 23°C / 50% rh

Tensile strength (dry, @50 mm/min)

Elongation at maximum force (dry, @50 mm/min)

Modulus of elasticity (dry, @1 mm/min)

55 MPa

1.2%

6 GPa

ISO 527

ISO 527

ISO 527

## Thermal properties

HDT A

Continuous service temperature (20.000 h)

Service temperature (during lifetime max. 200h)

90°C

120°C

160°C

ISO 75

IEC 60216

## Electrical properties

Insulation resistance strip electrode (R25)

Surface resistance (ROB)

>10<sup>9</sup> Ω

>10<sup>9</sup> Ω

DIN IEC 60167

DIN IEC 60093

## Flammability properties

Flammability behavior (1/16")

VO

UL 94

## Enclosure recommended

We recommend to 3D print Luvocom 3F PPS CF 9938 BK on printers with a closed chamber. A heated build chamber is not an absolute requirement, but can improve material properties for large(r) prints.



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## Drying Recommendations

Luvocom 3F PAHT KK 50056 BK FR is a hygroscopic filament and therefore it is necessary to pre-dry the filament in a blast drying oven at below settings:

- Temperature: 80°C
- Duration: ≥12 hours

For optimal print results we recommend to print the pre-dried Luvocom 3F PAHT KK 50056 BK FR filament from a drying box to avoid that the material can accumulate humidity from the environment.

## Buildplate adhesion

For optimal buildplate adhesion we recommend to set your buildplate temperature at 90°C - 110°C and to use a dedicated polyamide (PA) buildplate adhesive.

## Abrasiveness

Please be aware that ceramic microsphere reinforced filaments contain a relatively high concentration of extremely hard ceramic microspheres, which have an abrasive nature. In general these ceramic fillers will accelerate the nozzle-wear of brass nozzles, much faster than unfilled filaments. We recommend to use ruby nozzles or hardened steel nozzles.

## Storage and handling

Filament should be stored at room temperature in a dry and dark place with humidity below 15%. Recommended storage temperature is ca. 18-25°C (64.4 - 77.0°F). Keep out of moisture, sunlight and direct heat. When stored properly, product has a shelf life of 24 months. To obtain the best parameters of the printed object, it is recommended to dry the material prior to usage and to 3D print it directly from a dry box.

## Product export information

| HS Code  | Description                  | Origin         |
|----------|------------------------------|----------------|
| 39169090 | Monofilament for 3D printing | European Union |

## Disclaimer

*The product- and technical data provided in this datasheet is correct to the best of FormFutura BV's knowledge and are intended for reference and comparison purposes only. Actual values may vary according to printing conditions, model complexity, environmental conditions, etcetera. Typical values are indicative only and are not to be construed as being binding specifications. All other information supplied, including that herein, is considered accurate but is furnished upon the express condition that the customer shall make its own assessment to determine a product's suitability for a particular purpose. We make no warranty, express or implied, including regarding any information supplied or the data upon which it is based or the results to be obtained from the use of such products or information, or concerning product, whether of satisfactory quality, merchantability, fitness for any particular purpose or otherwise, or with respect to intellectual property infringement as a result of use of information or products, and none shall be implied.*

