

EXPERIMENTAL DATASHEET

TECHNYL 4EARTH A1E 60G1 V30 NC

Polyamide 66, 30% glass fiber reinforced, halogen and red phosphorus free flame retardant, heat-aging stabilized, for injection moulding

TECHNYL 4EARTH A1E 60G1 V30 NC is a partially recycled polyamide 66 based on a non-halogenated flame retardant system, reinforced with 30% of glass fiber, heat stabilized, for injection moulding. This partially recycled material has been developed to reduce its environmental footprint (3,4 kg CO2 eq. according to IPCC 2013 100a methodology) with respect to first-choice materials while offering excellent & identical flame retardant properties (UL 94 V0 - GWFI 960°C all at 0.8 mm thickness). It also offers unchanged mechanical and electrical performances with respect to virgin materials. It is already all colors UL yellow card registered for short-term properties (UL 94, 5VA, HWI, HAI, CTI) waiting for RTI ratings completion.

General

|                       |                                                               |                                                 |
|-----------------------|---------------------------------------------------------------|-------------------------------------------------|
| Feature               | UL V0<br>Heat-aging stabilized                                | Halogen and red phosphorus free flame retardant |
| Polymer type          | PA66 (Polyamide 66)                                           |                                                 |
| Processing technology | Injection molding                                             |                                                 |
| Certification         | RoHS<br>EC 1907/2006 (REACH)                                  | UL-Yellow Card                                  |
| Applications          | Automotive Applications<br>Electrical/Electronic Applications | Connectors                                      |
| Colors available      | Natural                                                       |                                                 |
| Forms                 | Pellets                                                       |                                                 |

Product identification

|                       |                                 |
|-----------------------|---------------------------------|
| ISO 1043 abbreviation | PA66-GF30(R50) FR(40)           |
| ISO 16396 designation | PA66,GF30FR(40)(R50),M1,S14-110 |

|                              | Condition   | Standard        | Unit              | Value       |
|------------------------------|-------------|-----------------|-------------------|-------------|
| Density                      |             | ISO 1183        | g/cm <sup>3</sup> | 1.43        |
| Water absorption             | 24 hr, 23°C | ISO 62          | %                 | 0.6 - 0.65  |
| Water absorption, saturation |             |                 | %                 | 4           |
| Molding shrinkage, parallel  |             | ISO 294-4, 2577 | %                 | 0.2 - 0.3   |
| Molding shrinkage, normal    |             | ISO 294-4, 2577 | %                 | 0.75 - 0.85 |

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|                                       | Condition | Standard     | Unit  | Value               |
|---------------------------------------|-----------|--------------|-------|---------------------|
| <b>Mechanical properties</b>          |           |              |       | <b>dam / cond.*</b> |
| Tensile modulus                       | 1 mm/min  | ISO 527-1/-2 | MPa   | 11000 / -           |
| Stress at break                       | 5 mm/min  | ISO 527-1/-2 | MPa   | 160 / -             |
| Strain at break                       | 5 mm/min  | ISO 527-1/-2 | %     | 2.6 / -             |
| Charpy impact strength, +23°C         | +23°C     | ISO 179/1eU  | kJ/m² | 60 / -              |
| Charpy impact strength, -30°C         | -30°C     | ISO 179/1eU  | kJ/m² | 55 / -              |
| Charpy notched impact strength, +23°C | +23°C     | ISO 179/1eA  | kJ/m² | 10.5 / -            |
| Charpy notched impact strength, -30°C | -30°C     | ISO 179/1eA  | kJ/m² | 10 / -              |

|                                          |          |             |    |     |
|------------------------------------------|----------|-------------|----|-----|
| <b>Thermal properties</b>                |          |             |    |     |
| Melting temperature, 10°C/min            |          | ISO 11357-1 | °C | 262 |
| Temp. of deflection under load, 1.80 MPa | 1.80 MPa | ISO 75      | °C | 248 |

|                                |            |             |       |       |
|--------------------------------|------------|-------------|-------|-------|
| <b>Electrical properties</b>   |            |             |       |       |
| Comparative tracking index     | Solution A | IEC 60112   | V     | 600   |
| CTI performance level category |            | Sol A       |       | PLC 0 |
| Dielectric strength            | 1 mm       | IEC 60243-1 | kV/mm | 36    |

|                                                                                                                 |                                                                                |                |    |              |
|-----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|----------------|----|--------------|
| <b>Burning behaviour</b>                                                                                        |                                                                                |                |    |              |
| UL Yellow Card availability  | Click here to have access to the UL Yellow Card → <a href="#">QMFZ2.E44716</a> |                |    |              |
| Flammability, 0.75 mm                                                                                           | 0.75 mm                                                                        | UL 94          |    | V0           |
| Flammability, 1.5 mm                                                                                            | 1.5 mm                                                                         | UL 94          |    | V0, 5VA      |
| Flammability, 3.0 mm                                                                                            | 3.0 mm                                                                         | UL 94          |    | V0, 5VA      |
| Glow-wire flammability index, GWFI, 0.75 mm                                                                     | 0.75 mm                                                                        | IEC 60695-2-12 | °C | 960          |
| Glow-wire flammability index, GWFI, 1.5 mm                                                                      | 1.5 mm                                                                         | IEC 60695-2-12 | °C | 960          |
| Glow-wire flammability index, GWFI, 3.0 mm                                                                      | 3.0 mm                                                                         | IEC 60695-2-12 | °C | 960          |
| Glow-wire ignition temperature, GWIT, 0.75 mm                                                                   | 0.75 mm                                                                        | IEC 60695-2-13 | °C | 750          |
| Glow-wire ignition temperature, GWIT, 1.5 mm                                                                    | 1.5 mm                                                                         | IEC 60695-2-13 | °C | 775          |
| Glow-wire ignition temperature, GWIT, 3.0 mm                                                                    | 3.0 mm                                                                         | IEC 60695-2-13 | °C | 800          |
| Burning rate, FMVSS, Thickness 1 mm                                                                             |                                                                                | FMVSS 302      |    | < 100 mm/min |

Test run at 23°C if not differently specified, DAM state (dry as moulded), valid for natural colored products.  
\*: conditioned according to ISO 1110

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|                               | Condition                                             | Standard | Unit | Value |
|-------------------------------|-------------------------------------------------------|----------|------|-------|
| <b>Processing conditions</b>  |                                                       |          |      |       |
| Drying temperature/time       | 75-85°C / 2-4h (with dew point of dried air < -30 °C) |          |      |       |
| Suggested max moisture        | 0.2 %                                                 |          |      |       |
| Rear temperature              | 265 - 275 °C                                          |          |      |       |
| Middle temperature            | 265 - 275 °C                                          |          |      |       |
| Front temperature             | 270 - 280 °C                                          |          |      |       |
| Recommended melt temperature  | 265 - 280 °C                                          |          |      |       |
| Recommended mould temperature | 60 - 90 °C                                            |          |      |       |

*These parameters are typical of the product but should be related to the type of machinery used and to the type of moulded part.*

**Injection notes**

The material is supplied in airtight bags, ready for use. In case that the virgin material has absorbed moisture, it must be dried with a dehumidified air drying equipment, dew point minimum -20°C. Recommended time 2-4h.

**Injection advice**

All reinforced, flame retardant compounds generate some level of abrasion/corrosion to the steel processing equipment. These issues may be magnified by using incorrect processing conditions (temperatures, residence time, moisture level ...) during the moulding process. Therefore, Domo recommends you adhere to the processing conditions detailed in this technical data sheet. For equipment that comes into contact with molten flame retardant compounds, Domo advises you to use a steel with high chromium and high carbon content (having a minimum concentration of 16% chromium) to prevent corrosion and abrasion. For the correct reference of steel associated to flame retardant compounds' processing, please refer to your equipment manufacturers. In the case of high requirements on surface quality a mould temperature of up to 120°C can be considered. The processing parameters like processing temperatures are a recommendation and can be adjusted in function of injection machine size, part geometry / design.

**Disclaimer**

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