



# Figure 4™ TOUGH-GRY 10

A high-speed material for the production of rigid gray parts

Production Rigid

Figure 4

## PRODUCTION PARTS IN A FRACTION OF THE TIME

Figure 4 TOUGH-GRY 10 is capable of print speeds up to 100 mm/hour in a strong production plastic. With 25% elongation at break, it has the durability required for a broad range of applications. This dark gray plastic material is extremely stable, including under high humidity conditions.

### Liquid Material

| MEASUREMENT   | CONDITION       | VALUE  |                          |
|---|-----------------|--|--------------------------|
| Viscosity   | @ 25 °C (71 °F) | 490 cps  |                          |
| Color   |                 | Dark Gray  |                          |
| Solid Density                                       | @ 25 °C (77 °F) | 1.11 g/cm <sup>3</sup>   | 0.04 lb/in <sup>3</sup>  |
| Liquid Density                                      | @ 25 °C (77 °F) | 1.04 g/cm <sup>3</sup>   | 0.038 lb/in <sup>3</sup> |
| Package Volume                                      |                 | 1 kg bottle - Figure 4 Standalone<br>10 kg container - Figure 4 Production |                          |
| Layer Thickness<br>(Standard Mode)                  |                 | 0.05 mm  | 0.002 in                 |
| Vertical Build Speed<br>Standard Mode<br>Draft Mode |                 | 78 mm/hr<br>104 mm/hr  | 3.1 in/hr<br>4.1 in/hr   |

## APPLICATIONS

- Rapid design iteration
- Strong functional parts for:
  - Automotive styling parts
  - Form, fit and function testing
  - Durable assemblies and snap fits
  - Bezels, covers, cases
  - Master patterns for RTV molding or other uses
- Short-run manufacturing of rigid parts
- Consumer goods
- Ready for painting or plating

## BENEFITS

- Strong, rigid production parts
- Stable mechanicals over time
- High production speed

## FEATURES

- High elongation at break
- Excellent humidity/moisture resistance
- Durable and strong
- Up to 100 mm/hour vertical print speed
- Dark gray color





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## Post-Cured Material

| MECHANICAL PROPERTIES                                    |            |        |        |
|--|------------|--------|--------|
| MEASUREMENT  | CONDITION  | METRIC | U.S.   |
| Tensile Strength (MPa   PSI)                             | ASTM D638  | 50     | 7190   |
| Tensile Modulus (MPa   KSI)                              | ASTM D638  | 2180   | 317    |
| Elongation at Break                                      | ASTM D638  | 25 %   |        |
| Elongation at Yield                                      | ASTM D638  | 4 %    |        |
| Flexural Strength (MPa   PSI)                            | ASTM D790  | 75     | 10900  |
| Flexural Modulus (MPa   KSI)                             | ASTM D790  | 2070   | 300    |
| Notched Izod Impact Strength (J/m   Ft-lbs/in)           | ASTM D256  | 29     | 0.54   |
| Unnotched Izod Impact Strength (J/m   Ft-lbs/in)         | ASTM D4812 | 598    | 11.2   |
| Heat Deflection Temperature @ 0.45 MPa (66 PSI)          | ASTM D648  | 59 °C  | 138 °F |
| @ 1.82 MPa (264 PSI)                                     |            | 51 °C  | 123 °F |
| Coefficient of Thermal Expansion (CTE) (ppm/°C   ppm/°F) | ASTM E831  |        |        |
| < Tg   |            | 93     | 52     |
| > Tg   |            | 165    | 92     |
| Glass Transition (Tg)                                    | DMA, E''   | 58 °C  | 136 °F |
| Hardness, Shore  | ASTM D2240 | 81D    |        |
| Water Absorption   | ASTM D570  | 0.34 % |        |



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