

# Figure 4™ TOUGH-GRY 15

## Production Rigid

An economical material for the production of rigid gray parts

Figure 4

### PRODUCTION PARTS AT AN ECONOMICAL PRICE

Figure 4 TOUGH-GRY 15 is designed to offer high strength and stability for production applications. Economical pricing allows short run production parts to be produced at a fraction of the cost of traditional methods. With 35% elongation at break, this durable opaque gray material produces highly accurate components for consumer goods, aerospace and automotive industries, with digital molding productivity and cost-efficiency.

### Liquid Material

MEASUREMENT	CONDITION	VALUE	
Viscosity	@ 25 °C (71 °F)	780 cps	
Color		Gray	
Solid Density	@ 25 °C (77 °F)	1.12 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 10 kg container - Figure 4 Production	
Layer Thickness (Standard Mode)		0.05 mm	0.002 in
Vertical Build Speed Standard Mode Draft Mode		41 mm/hr 68 mm/hr	1.6 in/hr 2.7 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
- Short-run manufacturing of rigid parts
- Consumer goods
- Ready for painting or plating

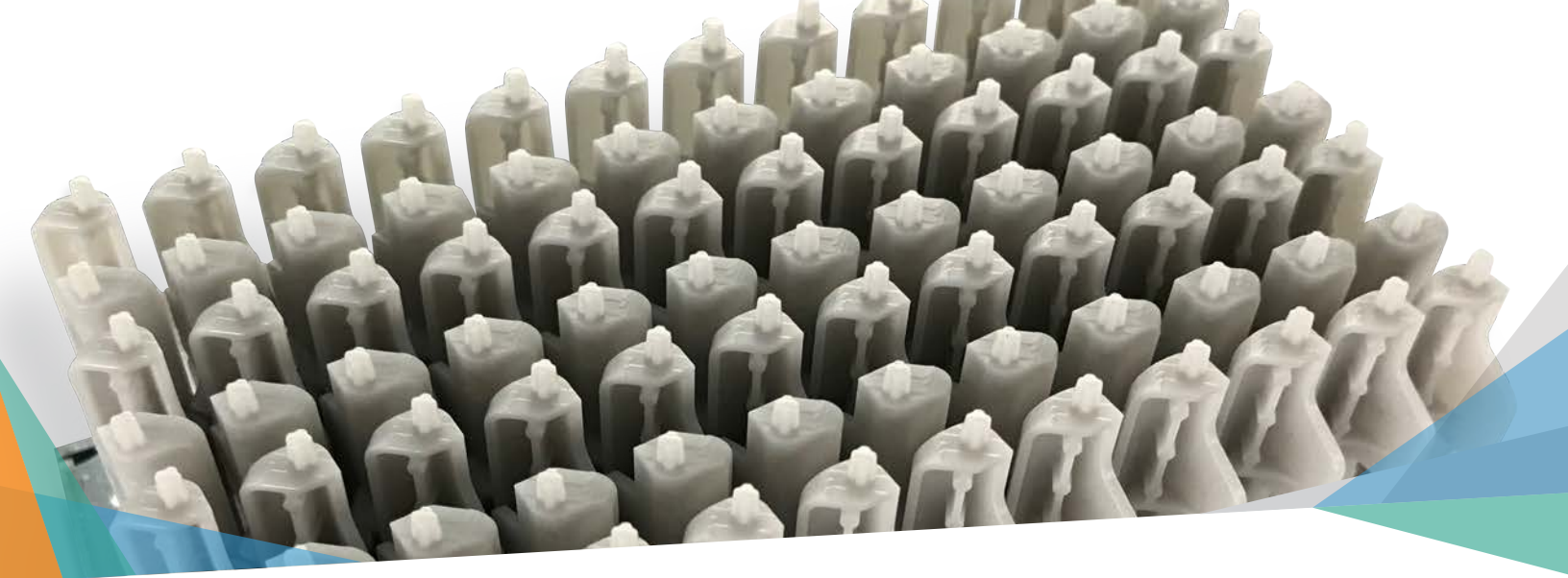
### BENEFITS

- Strong, rigid production parts
- Stable mechanicals over time
- Economically priced

### FEATURES

- High elongation at break
- Excellent humidity/moisture resistance
- Durable and strong
- Opaque gray color





# Figure 4™ TOUGH-GRY 15

## Production Rigid

An economical material for the production of rigid gray parts

Figure 4

### Post-Cured Material

MECHANICAL PROPERTIES			
MEASUREMENT	CONDITION	METRIC	U.S.
Tensile Strength (MPa   PSI)	ASTM D638	48	7020
Tensile Modulus (MPa   KSI)	ASTM D638	2120	307
Elongation at Break	ASTM D638	35 %	
Elongation at Yield	ASTM D638	4 %	
Flexural Strength (MPa   PSI)	ASTM D790	73	10590
Flexural Modulus (MPa   KSI)	ASTM D790	1960	284
Notched Izod Impact Strength (J/m   Ft-lbs/in)	ASTM D256	32	0.6
Unnotched Izod Impact Strength (J/m   Ft-lbs/in)	ASTM D4812	599	11.2
Heat Deflection Temperature @ 0.45 MPa (66 PSI) @ 1.82 MPa (264 PSI)	ASTM D648	59 °C	138 °F
		51 °C	124 °F
Coefficient of Thermal Expansion (CTE) (ppm/°C   ppm/°F) < Tg > Tg	ASTM E831	96	53
		158	88
Glass Transition (Tg)	DMA, E''	55 °C	130 °F
Hardness, Shore	ASTM D2240	82D	
Water Absorption	ASTM D570	0.37 %	



[www.3dsystems.com](http://www.3dsystems.com)

Warranty/Disclaimer: The performance characteristics of these products may vary according to product application, operating conditions, or with end use. 3D Systems makes no warranties of any type, express or implied, including, but not limited to, the warranties of merchantability or fitness for a particular use.

© 2018 by 3D Systems, Inc. All rights reserved. Specifications subject to change without notice. 3D Systems and the 3D Systems logo are registered trademarks and Figure 4 is a trademark of 3D Systems, Inc.