

# Tough Black 20

## Production Rigid

Strong production-grade material with long term UV stability

*Simulating Black ABS, the Tough Black 20 is specifically enhanced to be long-lasting and UV-resistant.*



### Benefits

- **Industry-leading environmental stability**
- **Remarkably fine and aesthetic surface finish**
- **High precision and long-term stability**

### Applications

- Rapid design iteration
- Strong functional parts for:
  - Automotive styling parts
  - Consumer electronics components
  - Legacy replacement parts
  - Form, fit and function testing
  - Durable assemblies and snap fits
  - Bezels, knobs, brackets, covers, cases
- Master patterns for RTV/silicone molding
- Short-run manufacturing of rigid parts



### Physical Properties

Colour	Black
Type	ABS

### Liquid Material

Solid Density (g/cm <sup>3</sup> )	1.11
Layer Thickness (mm)	0.05

### Mechanical Properties

		TEST/ISO
Tensile Strength, Ultimate (MPa)	40	ASTM D638
Tensile Strength, at Yield (MPa)	40	
Tensile Modulus (MPa)	1780	
Elongation at Break (%)	36	
Elongation at Yield (%)	4.6	
Flexural Strength (MPa)	61	ASTM D790
Flexural Modulus (MPa)	1650	
Notched Izod Impact Strength (J/m)	27	ASTM D256
Unnotched Izod Impact Strength (J/m)	1008	ASTM D4812
Heat Deflection Temperature (°C)		ASTM D648
@ 0.45 MPa	55	
@ 1.82 MPa	45	
Co-efficient of Thermal Expansion (ppm/°C)		ASTM E831
<T <sub>g</sub>	83	
>T <sub>g</sub>	173	
Glass Transition (T <sub>g</sub> )	46°C	ASTM E1640
Shore Hardness	79D	ASTM D2240
Water Absorption (%)	0.31	ASTM D570

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