Tango Family of Rubber-Like Materials

Overview

The Tango™ family of printing materials simulates the characteristics of rubber. These materials offer a variety of flexibility, high elongation-at-break, tear resistance and tensile strength.

The Tango family includes the following basic materials:

- TangoGray™ (FLX950) — A gray material with a Shore A hardness of 73 – 77
- TangoBlack™ (FLX973) — A black material with a Shore A hardness of 60 – 62
- TangoPlus™ (FLX930) — A translucent material with a Shore A hardness of 26 – 28
- TangoBlackPlus™ (FLX980) — A jet-black material with a Shore A hardness of 26 – 28

Rubber-like digital materials with varying Shore values and colors are fabricated by combining TangoPlus and TangoBlackPlus with rigid printing materials. For more information, see Digital Materials specification sheets on stratasys.com.

Practical applications for Tango materials include:

- Realistic simulation of rubber parts
- Soft-touch parts and non-slip surfaces
- Rubber-like surrounds and overmolding
- Knobs, grips, seals, gaskets, hoses, footwear, handles, etc.

Figure 1: Tire prototype made from Tango material.

Best Practice

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3D PRINT BUREAU

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This document describes recommendations and tips for achieving optimum quality and advanced mechanical properties when printing parts with Tango materials.

- Printing modes
- Preparing printer components
- Preparing trays for printing
- Removing support material
- Printer parameter settings

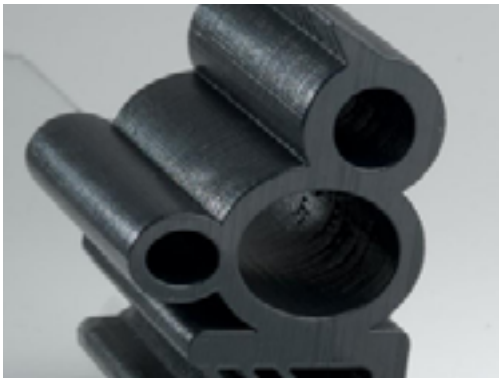

Figure 2: Shock absorption prototype.

Printing Recommendations and Tips

Printing Modes

Printer & Printing Mode		TangoBlack	TangoGray	TangoPlus	TangoBlackPlus
Eden330™	HQ	Z-axis ≤ 100 mm			
	HS	Not supported			
Eden350™	HQ	Z-axis ≤ 100 mm		X-axis ≤ 310 mm; Y-axis ≤ 108 mm; Z-axis ≤ 100 mm	
	HS	Not supported			
Eden260V™/350V™/500V™	HQ	Not supported			
	HS	Supported			
Objet260 Connex1,2,3™ Objet350 Connex1,2,3™ Objet500 Connex1,2,3™	HQ	Not supported			
	HS	Supported			
	DM	Supported			
Objet30 Prime™	HQ	Not supported			
	HS	Supported		Not supported	
	Draft	Not supported			
J735™/J750™	HQ	Not supported			
	HS	Not supported		Supported	
	HM	Not supported		Supported	

Important: For best results, use High Speed mode when printing single-material parts with TangoGray or TangoBlack.

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Preparing Printer Components

Stopping and resuming a Tango print job may adversely affect model quality and color uniformity. Therefore, before printing with Tango materials, perform all tasks necessary to ensure that the print job is not interrupted. For example, checking that the waste container is not full and that there is sufficient printing material loaded.

Preparing Trays for Printing

The arrangement of parts on the build tray and other factors affect the duration of printing and the quality of the printed part.

- Internal stress may cause parts to curve upwards and detach from the tray.

To reduce this possibility:

  - When printing parts that have a high aspect ratio (X:Y), position the longer edge along the X-axis (see Figure 4).
  - Print semi-full trays, if possible, for shorter print jobs.

- Position thin and delicate parts face up. This improves their resistance to tear.
- If possible, position the vertical walls parallel to the X-axis (Figure 5). This reduces the impact of roller on these walls.
- Print with a glossy surface finish, especially for delicate and thin parts.

  Note: For single-material printing with Tango, the default surface finish is glossy. For multiple-material printing with Tango the default surface finish is matte.

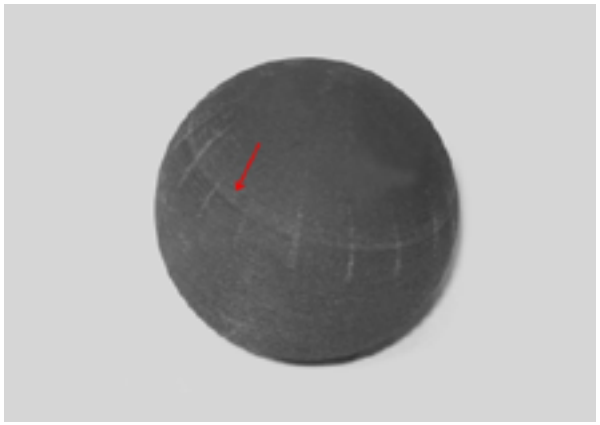

Figure 3: This model has a “seam” where the print job was interrupted.

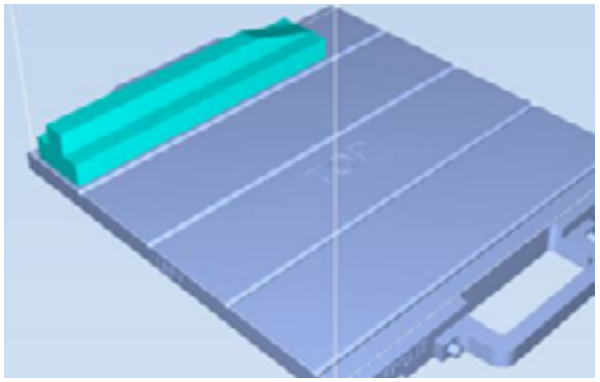

Figure 4: Long edge is along the X-axis.

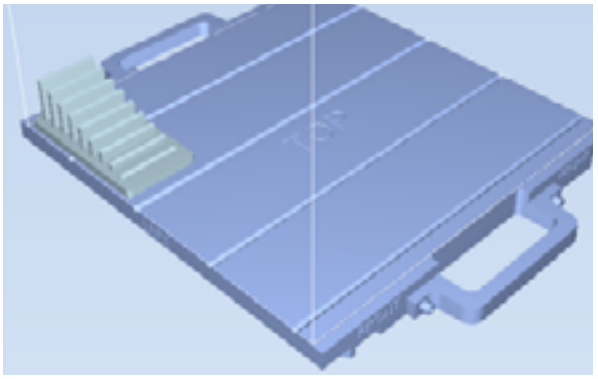

Figure 5: Vertical walls are parallel to the X-axis.

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- Consider the overall geometry of all Tango parts on the build tray. The recommended grid style is Heavy, except for hollow models and delicate models, including models with thin walls. In these cases, use the Lite grid style. This support structure is weaker, which makes it easier to remove from printed models.

To set the grid style:

- In Objet Studio™, from the Model Toolbar, select Advanced Properties.
- In the Advanced Properties dialog box, select Heavy.

Removing Support Material

Proper handling and cleaning of Tango parts is required for best results. To avoid scratching the surface or tearing delicate parts when using a water jet, adjust the water pressure to the minimum required for support removal.

Caution: When SUP706™ support material is used for printing parts with Heavy or Standard grid style, remove the support material with a water jet. Dissolving the support material in the DT3 or CSIIP cleaning station might clog the filter.

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Printer Parameter Settings

When printing with Tango materials, some printer parameters are automatically adjusted to ensure optimum part quality.

Objet™ desktop printer

- Pedestal height
- Adherence to tray

Eden™ printers

- Roller velocity

Connex™ printers

- Roller velocity
- Activation of only one UV lamp in Digital Material and High Mix printing modes when printing parts with TangoPlus, TangoBlackPlus and flexible digital materials based on them.

Figure 6: Heavy grid style selected.

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