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.

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.

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

A. Printing Modes
B. Preparing Printer Components
C. Preparing Trays for Printing
D. Removing Support Material
E. Printer Parameter Settings
Printing Recommendations and Tips

A. Printing Modes

<table>
<thead>
<tr>
<th>Printer and Printing Mode</th>
<th>TangoBlack</th>
<th>TangoGray</th>
<th>TangoPlus</th>
<th>TangoBlackPlus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eden330</td>
<td>HQ</td>
<td></td>
<td></td>
<td>Z-axis ≤ 100 mm</td>
</tr>
<tr>
<td></td>
<td>HS</td>
<td></td>
<td>Not supported</td>
<td></td>
</tr>
<tr>
<td>Eden350</td>
<td>HQ</td>
<td>Z-axis ≤ 100 mm</td>
<td></td>
<td>X-axis ≤ 310 mm;</td>
</tr>
<tr>
<td></td>
<td>HS</td>
<td></td>
<td></td>
<td>Y-axis ≤ 108 mm;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Z-axis ≤ 100 mm</td>
</tr>
<tr>
<td>Eden260V/350V/500V</td>
<td>HQ</td>
<td>Not supported</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>HS</td>
<td>Support</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Objet260 Connex</td>
<td>HQ</td>
<td>Not supported</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Connex350/500</td>
<td>HS</td>
<td>Supported</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Objet260/350/500</td>
<td>DM</td>
<td>Supported</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Objet30 Prime</td>
<td>HQ</td>
<td>Not supported</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>HS</td>
<td>Support</td>
<td>Not supported</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Draft</td>
<td></td>
<td>Not supported</td>
<td></td>
</tr>
<tr>
<td>Stratasys J750/J735</td>
<td>HQ</td>
<td>Not supported</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>HS</td>
<td>Not supported</td>
<td></td>
<td>Support</td>
</tr>
<tr>
<td></td>
<td>HM</td>
<td>Not supported</td>
<td></td>
<td>Support</td>
</tr>
</tbody>
</table>

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

B. 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.

C. 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 (see 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.](image)
• 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:
1. In Objet/PolyJet Studio, from the Model Toolbar, select Advanced Properties.
2. In the Advanced Properties dialog box, select Heavy.

D. 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 waterjet, 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 WaterJet. Dissolving the Support material in the DT3 or CSIIP cleaning station might clog the filter.

E. 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
  • deactivation of one UV lamp when printing parts with TangoPlus, TangoBlackPlus, and flexible digital materials based on them.

Disclaimer

Customer acknowledges the contents of this document and that Stratasys parts, materials, and supplies are subject to its standard terms and conditions, available on http://stratasys.com/legal/terms-and-conditions-of-sale, which are incorporated herein by reference.

Stratasys info@stratasys.com
www.stratasys.com
7665 Commerce Way 2 Holtzman St.,
Eden Prairie, MN 55344 Science Park, PO Box 2496
+1 888 480 3548 (US Toll Free) Rehovot 76124, Israel
+1 952 937 3000 (Intl) 972 74 745-4000
+1 952 937 0070 (Fax) 972 74 745-5000 (Fax)

ISO 9001:2008 Certified

© 2018 Stratasys Ltd. All rights reserved. Objet, Objet Studio, Objet30, Objet260, Objet350, Objet500, PolyJet Studio, Eden, Connex, SUP706, TangoBlack, TangoGray, TangoPlus, TangoBlackPlus, Stratasys J750, Stratasys J735, Stratasys, and Stratasys nautilus logo are trademarks of Stratasys Ltd. and/or its subsidiaries or affiliates and may be registered in certain jurisdictions. All other trademarks belong to their respective owners. For more information about Stratasys systems, materials and applications, visit www.stratasys.com