



# ABS-ESD7

## Material Guide

ABS-ESD7™ (acrylonitrile butadiene styrene-electrostatic dissipative) is an ABS thermoplastic with static dissipative properties for static-sensitive applications. ABS-ESD7 prevents static electricity buildup so it does not produce a discharge or attract other materials like powders, dust and fine particles.

### System Overview and Compatibility

ABS-ESD7 is currently available on the following 3D printers, with a 0.007 in. (0.178 mm) and 0.010 in. (0.254 mm) slice height on all systems:

- F370™
- Fortus 380mc™
- Fortus 450mc™
- Fortus 900mc™
- F900™

## System Overview and Compatibility (cont.)

It is compatible with SR-30™ and SR-35™ soluble support materials on the Fortus 380mc, Fortus 450mc, Fortus 900mc and the F900. It requires a T16 tip (0.010 in. [0.0004 mm] layer height) or a T12 tip (0.007 in. [0.0003 mm] layer height) for the model and a T12SR30 tip for all layer heights with both support materials. These systems utilize large and small low-temperature build sheets. It is compatible with QSR Support™ on the F370 as a soluble support system and requires standard F370 extrusion heads for all layer heights, both for support and model materials. This system uses the standard F123™ Series build tray.

ABS-ESD7 is available in standard 92.3-cubic-inch Fortus Plus and Fortus Classic canisters as well as a standard F123 90-cubic-inch spool.

SR-30 and SR-35 are available in standard 92.3 cubic inch Fortus Plus, Fortus Classic canisters and XTEND™ 500 (SR-30 only), and QSR is available in standard F123 60-cubic-inch spools.

## Part Design

Designing parts for ABS-ESD7 follows a similar process for designing other FDM® parts, and design for additive manufacturing guidelines (DFAM) should be followed (e.g., utilizing self-supporting angles where possible, observing minimum wall thicknesses, allowing proper clearance for assemblies). A general list of DFAM guidelines can be found in the [FDM Design Guidelines document](#).

For ABS-ESD7 and other low-temperature FDM materials, the soluble support system is used to support the model material in areas of overhang to prevent sagging. While the support can be removed by hand, it is also soluble in P400SC WaterWorks™ cleaning solution. The designer should take this into account when designing the part, allowing for more complex geometries that could not otherwise be made if the support had to be removed by hand. Self-supporting angles (angles greater than 43 degrees from the build platen) should be used whenever possible to reduce the need for support material.

In order to design for ESD properties see the ABS-ESD7 ESD White Paper.

## Part Processing

This material is available in Insight™ and the Advanced FDM feature of GrabCAD Print™ software.

Support removal is the main consideration that should be taken into account during part processing. In areas where support cannot be eliminated by part design, the part must be oriented so the support is accessible for removal or dissolution. Perforation layers can be added to the support structure to aid in removal of large areas of support.

Default processing parameters should be used unless the user is sufficiently advanced in Insight or GrabCAD Print and has determined that the changed values produce better results for a specific geometry.

## Part Packing

Multiple ABS-ESD7 parts can be packed together in the same build. This often reduces build time (due to elimination of tip swaps between model and support for each part) and should be used to increase system utilization by eliminating downtime when operators are not present. For example, add another part to the pack so the build will finish in the morning rather than at night, or pack multiple parts together for a longer build over the weekend.

For higher quality seams and a reduced potential for purge material in the part, a sacrificial tower should be included in the pack, up to the full height of the parts. Refer to the **Options > Sacrificial tower** menu in Control Center™ software.

## System Preparation

The systems should be set up using the tips and build sheets or trays mentioned in the system overview section of this document. A tip calibration must be performed when switching from a different material to ABS-ESD7, when replacing the tip at the end of its recommended life, or anytime the model or support tips are removed from the head.

The tip life for ABS-ESD7 tips can be found in **Table 1**. The user will receive a warning one canister (Fortus) or 300 hours (F123) before tip life is reached and will be prevented from starting another build if the tip has not been changed after tip life has been reached. It should be noted that many short toolpaths are harder on the tip than longer toolpaths. When building parts with many short toolpaths, it is recommended to change the tip when the tip warning is displayed to prevent a potential decrease in print quality.

## Support Removal

Parts are easily removed from the build sheet or tray by first removing them from the machine and then flexing the sheet or tray. Once parts are removed from the build sheet/tray, support material can be broken off by hand or submerged into P400SC WaterWorks cleaning solution at 70 degrees to be dissolved.

## Part Processing

ABS-ESD7 can be sanded, painted, media blasted, bonded, machined, drilled, receive inserts, etc., similarly to other FDM thermoplastics.

Tip	Tip Life
T12SR30 (0.007 in. layer height)	6 canisters
T12SR30 (0.010 in. layer height)	7 canisters
T12	8.5 canisters
T16	10 canisters
F370 Extrusion Head Standard	1500 hours

Table 1. Tip life for tips used to print ABS-ESD7.

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