SmartAgain®

Printing Guide

QuinLyte Material Technology B.V.

For more information visit https/smartagain.nl
Or email to: info@quinlyte.com

Introduction

SmartAgain® is a Nylon (mainly PA6) and Polyolefin (mainly PP) alloy. The printed object has excellent surface quality, is tough (strong but not or brittle), and is excellent in hydrolysis, electrical, thermal, and chemical resistance.

1. Filament handling

Compared with Nylon filaments, SmartAgain® is much less sensitive to moisture. However, when it is exposed in air for several weeks, strings, drips, or bursts of air bubbles may show up during printing.

Dry the spool in a ventilated household oven at 80°C for at least four up to eight hours will fix the problem.

2. Printing preparation and key settings

• Build plate adhesion[2.1)]	Brim	(width 8 – 12 mm)
• Print temperature	250°C	(245°C – 265°C)
• Build plate temperature	35°C	(30°C – 65°C)
• Print speed	30 mm/s	(20 – 80 mm/s)
• Retraction distance [2.2)]	4.5 -5.5 mm	(0.8 -2.0mm for direct extruder)
• Cooling [2.3)]	2%	

2.1 Building plate adhesion

SmartAgain® requires adhesive and brim to work together to minimize warpage from build plate.

Before the first print, apply two thin layers of adhesive on the build plate. After the print, don't remove the adhesive. Just before the next print, use a flat blade to gently 'shave away' the top surface of build plate, remove the scraps, then apply one new thin layer of adhesive.

Use solvent free, water-soluble office-use glue stick as adhesive. The highly recommended brand is Tesa® (model: 57026).

A well printed brim that adheres airtightly on the build plate is translucent. It works like a vacuum sucking membrane to hold the object on the plate.

To avoid failure, always stay next to the printer until the first layer is well printed.

2.2 Retraction

SmartAgain® works well with printer's normal retraction settings. If blobs or strings show up on the surface of printed object, it is probably not caused by retraction settings, but by over moisturized material (see Chapter 1).

2.3 Cooling

SmartAgain® shall print with minimal cooling to reach higher layer adhesion and to reduce warpage.

But max cooling is necessary to print very-short-printing-time layers. The max cooling speed can be set up to 100%, the threshold to max cooling is around 10 seconds of printing time per layer.

3. Printing with support

SmartAgain® is compatible with PVA.

However, if the support structures are not inside the model, SmartAgain® can be applied as the break-away material for itself. The printing quality is almost identical to that of using PVA by using the following settings:

• Support line width	0,4 mm	(same for 0,4 and 0,8mm nozzle)
• Support flow	80%	
• Support density	10%	
• Support top distance	0,2 mm	
• Support bottom distance	0,4 mm	
• Enable support roof	Yes	
• Support roof density	100%	
• Support roof line pattern	Lines	
• Enable support tower	Yes	

4. Warpage

As a truly semi-crystalline material, SmartAgain® crystallizes during printing which will cause warpage. However, warpage can be minimized to almost ignorable by following the settings in this Guide, and by printing a more balanced structure:

• Wall thickness	0.8 mm	
• Top/bottom thickness	0,8 mm	
• Infill density	40%	
• Infill pattern	Gyroid	(Lightening for show models)

In an ambient indoor environment (build plate 35°C, without enclosure), higher printing temperature and slower printing speed are good to minimize warpage.

5. Fast printing

SmartAgain® has a unique feature which most other materials doesn't have: It supports fast printing.

However, it is very important to choose the right fast printing strategy to avoid unnecessary material loss.

Fast Printing strategy		Suitable applications
Option A	0.4 mm nozzle, keep the layer height (0,2mm or lower), but double or triple the printing speed	Show models e.g. medical or architecture models
Option B	0,4 mm nozzle, but increase the layer height e.g. from 0,2mm to 0,3mm	General prints
Option C	Keep the same layer height e.g. 0,2mm, but change the 0,4mm nozzle to 0,8mm nozzle	Mechanical or Engineering parts
Option D	0,8mm nozzle, print at 0,3 mm layer height	Large parts or batch production e.g. jigs & fixtures

Attention: When switching to bigger nozzle or higher layer height, check the settings listed in chapter 3 and 4. These settings should remain the same. Regular cooling may be slightly increased e.g. to 5-10%, when printing with 0.8mm nozzle.

6. Accurate dimension

To make the dimension of printed model the same as that of design, it is necessary to scale up the model slightly because SmartAgain® shrinks during printing (not after printing). The scale varies from +0,6% to +1,0% depends on printers.

7. Scrapes from printing

SmartAgain® is a circular-use polymer. If you have large quantities of scraps printed from SmartAgain®, contact info@quinlyte.com to arrange recycling service.

8. Food Contact & Medical Use statement

SmartAgain® is a multi-polymer alloy made from food contact polymeric materials. It holds no other additive, plasticizer, or filler. However, it has not been assessed or certified yet for food contact or medical use compatibility. QuinLyte denies any liability for incidental, consequential or any other damages arising from the use or misuse of SmartAgain® in food or medication applications. It is the sole responsibility of the user to assess the suitability of SmartAgain® for their intended applications.