



ENDER ALUMNI *WORKFLOW*

Two Color Prints

March 2023

* CODE PREPARATION

* MACHINE OPERATION



SLICE PART, NOTE TOTAL LAYERS

TWO COLOR WORKFLOW 2023

The screenshot shows the Ultimaker Cura software interface. The main window displays a 3D model of a red and yellow 'RSPACE' part on a grid. The 'PREVIEW' tab is active. The 'Print settings' panel on the right shows the 'Quality' section with a layer count of 80. An orange arrow points to this value with the text 'NOTE 80'. The bottom right corner shows a summary box with the following information:

- 2 hours 54 minutes
- 19g - 6.24m - \$ 0.37
- Save to Disk

The 'Object list' in the bottom left corner shows the object 'CE3_Fidget Cube2023' with dimensions '65.5 x 32.5 x 16.0 mm'.



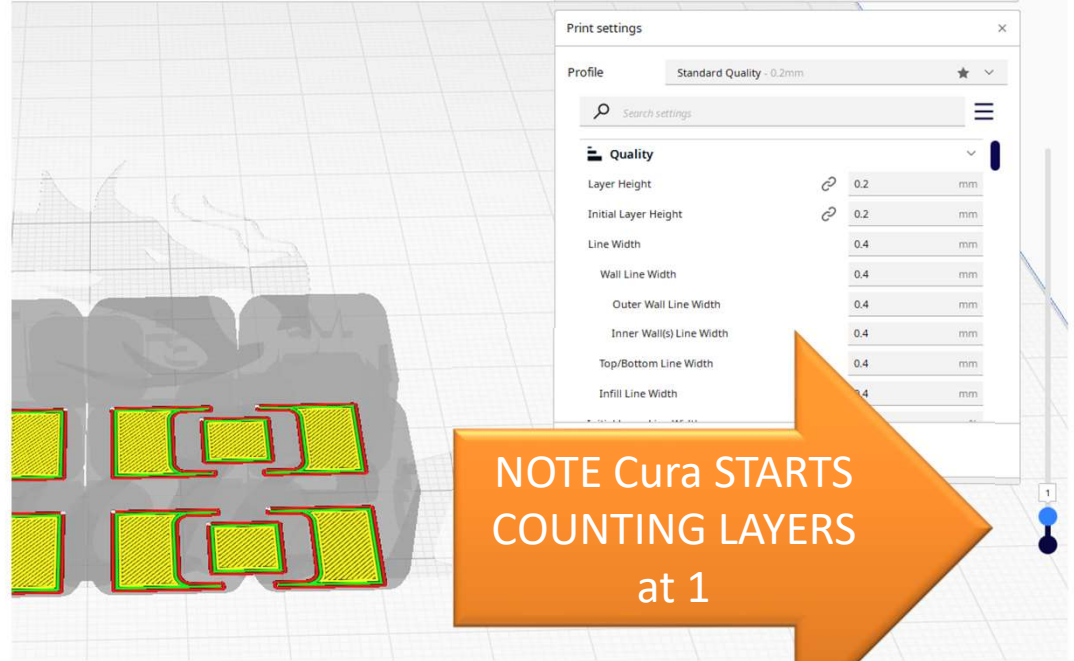
PULL GCODE INTO TEXT EDITOR

TWO COLOR WORKFLOW 2023

```

1 ;FLAVOR:Marlin
2 ;TIME:10472
3 ;Filament used: 6.2357m
4 ;Layer height: 0.2
5 ;MINX:84.086
6 ;MINY:100.585
7 ;MINZ:0.2
8 ;MAXX:150.914
9 ;MAXY:134.415
10 ;MAXZ:16
11 ;Generated with Cura_SteamEngine main
12 M140 S60
13 M105
14 M190 S60
15 M104 S210
16 M105
17 M109 S210
18 M82 ;absolute extrusion mode
19 ; Ender 3 Custom Start G-code
20 G92 E0 ; Reset Extruder
21 G28 ; Home all axes
22 G1 Z2.0 F3000 ; Move Z Axis up little to prevent scratching of Heat Bed
23 G1 X0.1 Y20 Z0.3 F5000.0 ; Move to start position
24 G1 X0.1 Y200.0 Z0.3 F1500.0 E15 ; Draw the first line
25 G1 X0.4 Y200.0 Z0.3 F5000.0 ; Move to side a little
26 G1 X0.4 Y20 Z0.3 F1500.0 E3 ; Draw the second line
27 G92 E0 ; Reset Extruder
28 G1 Z2.0 F3000 ; Move Z Axis up little to prevent scratching of Heat Bed
29 G1 X5 Y20 Z0.3 F5000.0 ; Move to start position
30 G92 E0
31 G92 E0
32 G1 F2700 E-5
33 ;LAYER_COUNT:
34 ;LAYER:0
35 M107
36 ;MESH:Fidget Cube
37 GO F6000 X94.599 Y104.412 Z0.3 E0.38618
38 ;TYPE:WALL-INNER
39 G1 F2700 E0
40 G1 F1156.6 X94.943 Y114.412 E0.38618
41 G1 F1140.1 X94.525 Y114.325 E0.38618
42 G1 F1179.4 X94.174 Y114.101 E0.38618
43 G1 F1200 X93.84 Y113.769 E0.38618
44 G1 X93.582 Y113.24 E0.07671
45 G1 X93.52 Y112.817 E0.09093
46 G1 X93.522 Y105.613 E0.33053
47 G1 X93.602 Y105.196 E0.34465
48 G1 X93.801 Y104.793 E0.3596
49 G1 F1179.4 X94.138 Y104.412 E0.37682
50 G1 F1151.1 X94.37 Y104.274 E0.38618
51 G1 F1129.4 X94.602 Y104.136 E0.39572
52 G1 F1071.4 X94.796 Y104.049 E0.40364
53 G1 X94.575 Y104.03 E0.4119
54 G1 F1159.4 X94.148 Y104.015 E0.42661
55 G1 F1200 X87.516 Y104.015 E0.64719
56 G1 X87.516 Y114.484 E0.99539
57 G1 X89.877 Y114.484 E1.07392
    
```

NOTE GCODE
STARTS COUNTING
LAYERS at 0



NOTE Cura STARTS
COUNTING LAYERS
at 1



E3 Club



Locate Layer to make filament change

TWO COLOR WORKFLOW 2023

The screenshot shows a Notepad++ window with a G-code file open. The search dialog is set to find the text ':LAYER:39'. The search results are highlighted in the G-code file. A large orange arrow points from the search dialog to the text 'Find Layer to switch color'.

```
101405 G0 X118.601 Y102.316
101406 ;TYPE:FILL
101407 G1 F3000 X122.276 Y105.991 E3149.10497
101408 G0 F9000 X122.14 Y105.819
101409 G0 X120.923 Y106.342
101410 G0 X120.931 Y106.563
101411 G1 F3000 X122.063 Y102.342 E3149.25032
101412 G0 F9000 X121.937 Y102.52
101413 G0 X122.597 Y103.259
101414 G0 X122.788 Y103.156
101415 G1 F3000 X112.612 Y105.883 E3149.60072
101416 G0 F9000 X112.764 Y105.731
101417 G0 X111.155 Y104.141
101418 G0 X111.928 Y104.129
101419 G1 F3000 X114.368 Y106.569 E3149.71549
101420 G0 F9000 X114.718 Y106.568
101421 G1 F3000 X115.962 Y101.929 E3149.87524
101422 G0 F9000 X115.95 Y102.45
101423 G1 F2700 E3144.87524
101424 ;MESH:NONMESH
101425 G0 F300 X115.95 Y102.45 Z8
101426 G0 F9000 X112.365 Y102.517
101427 G0 X100.15 Y115.087
101428 G0 X98.154 Y116.353
101429 G1 F2700 E3149.87524
101430 G0 F9000 X98.234 Y116.65
101431 ;TIME_ELAPSED:5300.954999
101432 #LAYER:39
101433 ;TYPE:WALL-INNER
101434 ;MESH:Fidget_Cube2023.stl
101435 G1 F1500 X98.518 Y116.494 E3149.88601
101436 G1 X98.75 Y116.332 E3149.89543
101437 G1 X99.02 Y116.11 E3149.90705
101438 G1 X99.326 Y115.823 E3149.92101
101439 G1 X99.541 Y115.598 E3149.93136
101440 G1 X99.738 Y115.368 E3149.94143
101441 G1 X99.96 Y115.07 E3149.95379
101442 G1 X100.15 Y114.75 E3149.96617
101443 G1 X100.15 Y103.875 E3150.32787
101444 G1 X100.15 Y103.725 E3150.33286
101445 G1 X99.942 Y103.401 E3150.34567
101446 G1 X99.739 Y103.131 E3150.3569
101447 G1 X99.544 Y102.903 E3150.36688
101448 G1 X99.209 Y102.56 E3150.38283
101449 G1 X98.83 Y102.222 E3150.39972
101450 G1 X98.511 Y102 E3150.41264
101451 G1 X98.234 Y101.851 E3150.4231
101452 G1 X96.561 Y101.85 E3150.47875
101453 G1 X96.56 Y102.251 E3150.49209
101454 G1 X96.464 Y102.577 E3150.50339
101455 G1 X96.349 Y102.707 E3150.50916
101456 G1 X96.044 Y102.85 E3150.52037
101457 G1 X91.335 Y102.847 E3150.67699
101458 G1 X91.097 Y102.769 E3150.69532
101459 G1 X90.874 Y102.542 E3150.6989
101460 G1 X90.799 Y102.25 E3150.70593
101461 G1 X90.799 Y101.851 E3150.7192
```



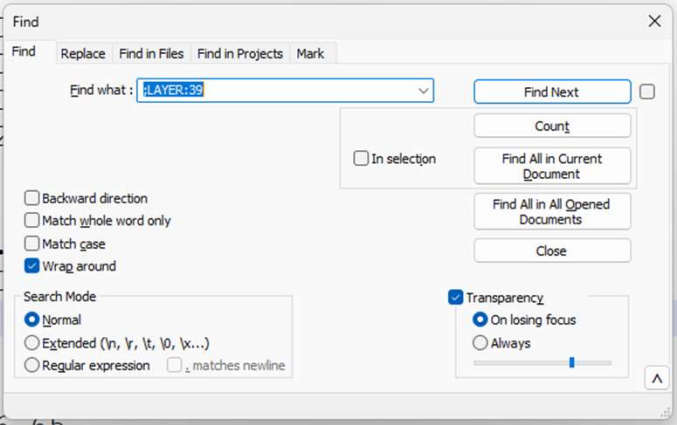
Locate Layer to make filament change

TWO COLOR WORKFLOW 2023

```

101417 G0 X112.155 Y104.141
101418 G0 X111.928 Y104.129
101419 G1 F3000 X114.368 Y104.129
101420 G0 F9000 X114.718 Y104.129
101421 G1 F3000 X115.962 Y104.129
101422 G0 F9000 X115.95 Y104.129
101423 G1 F2700 E3144.87524
101424 ;MESH:NONMESH
101425 G0 F300 X115.95 Y102.129
101426 G0 F9000 X112.365 Y102.129
101427 G0 X100.15 Y115.087
101428 G0 X98.154 Y116.353
101429 G1 F2700 E3149.87524
101430 G0 F9000 X98.234 Y116.65
101431 ;
101432 ;===== Insert Color Change Here =====
101433 ; -- ENDER ALUMNI CLINIC --
101434 ; Switch over filament move head a little up to have clearance
101435 M600 B3 Z25.4 ; Filament change, alert operator with 3 beeps, move one inch in Z for clearance
101436 ;
101437 ; ===== That's it!! =====
101438 ;
101439 ;
101440 ;TIME_ELAPSED:5300.954999
101441 ;LAYER:39
101442 ;TYPE:WALL-INNER
101443 ;MESH:Fidget Cube2023.stl
101444 G1 F1500 X98.518 Y116.494 E3149.88601
101445 G1 X98.75 Y116.332 F3149.89543

```



RESAVE and RUN Gcode Program



Marlin Reference for M600



- M428: Home Offsets Here
- M430: Power Monitor
- M486: Cancel Objects
- M500: Save Settings
- M501: Restore Settings
- M502: Factory Reset
- M503: Report Settings
- M504: Validate EEPROM contents
- M510: Lock Machine
- M511: Unlock Machine
- M512: Set Passcode
- M524: Abort SD print
- M540: Endstops Abort SD
- M569: Set TMC stepping mode
- M575: Serial baud rate
- M593: Input Shaping
- M600: Filament Change**
- M603: Configure Filament Change
- M605: Multi Nozzle Mode
- M665: Delta Configuration
- M665: SCARA Configuration
- M666: Set Delta endstop adjustments
- M666: Set dual endstop offsets
- M672: Duet Smart Effector sensitivity
- M701: Load filament
- M702: Unload filament
- M710: Controller Fan settings
- M808: Repeat Marker
- M810-M819: G-code macros
- M851: XYZ Probe Offset
- M852: Bed Skew Compensation
- M860-M869: I2C Position Encoders
- M871: Probe temperature config
- M876: Handle Prompt Response
- M900: Linear Advance Factor
- M906: Stepper Motor Current
- M907: Set Motor Current
- M908: Set Trimpot Pins
- M909: DAC Print Values
- M910: Commit DAC to EEPROM
- M911: TMC OT Pre-Warn Condition
- M912: Clear TMC OT Pre-Warn
- M913: Set Hybrid Threshold Speed
- M914: TMC Bump Sensitivity
- M915: TMC Z axis calibration
- M916: L6474 Thermal Warning Test

M600 - Filament Change

`M600` filament Automatically change filament ADVANCED_PAUSE_FEATURE



Description

The `M600` command initiates the filament change procedure. The basic procedure will move the print head away from the print, eject the filament, wait for new filament to be inserted and the user to confirm, load and prime the filament, and continue with the print. `M600` may be initiated automatically if a filament runout sensor is installed.

Notes

Requires `ADVANCED_PAUSE_FEATURE`.

The settings for this command can be found in `configuration_adv.h`. At this time `M600` requires an LCD controller.

Usage

`M600` `[B<beeps>]` `[E<pos>]` `[L<pos>]` `[R<temp>]` `[T<index>]` `[U<pos>]` `[X<pos>]` `[Y<pos>]` `[Z<pos>]`

Parameters

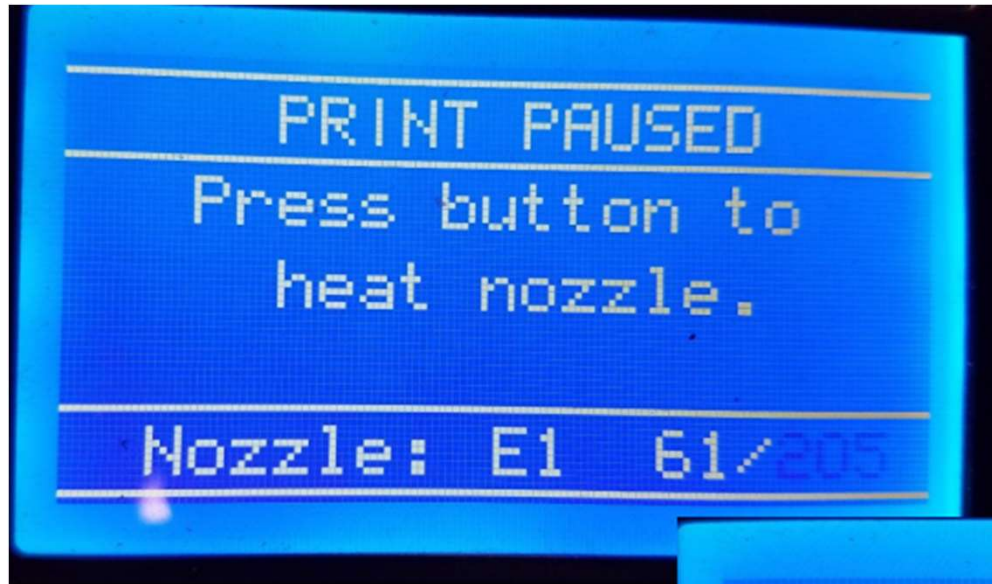
- `[B<beeps>]` Number of beeps to alert user of filament change (default `FILAMENT_CHANGE_ALERT_BEEPS`)
- `[E<pos>]` Retract before moving to change position (negative, default `PAUSE_PARK_RETRACT_LENGTH`)
- `[L<pos>]` Load length, longer for bowden (negative)
- `[R<temp>]` Resume temperature. (AUTOTEMP: the min auto-temperature.)
- `[T<index>]` Target extruder
- `[U<pos>]` Amount of retraction for unload (negative)
- `[X<pos>]` X position for filament change
- `[Y<pos>]` Y position for filament change
- `[Z<pos>]` Z relative lift for filament change position

Examples



Once M600 is executed...waits

TWO COLOR WORKFLOW 2023

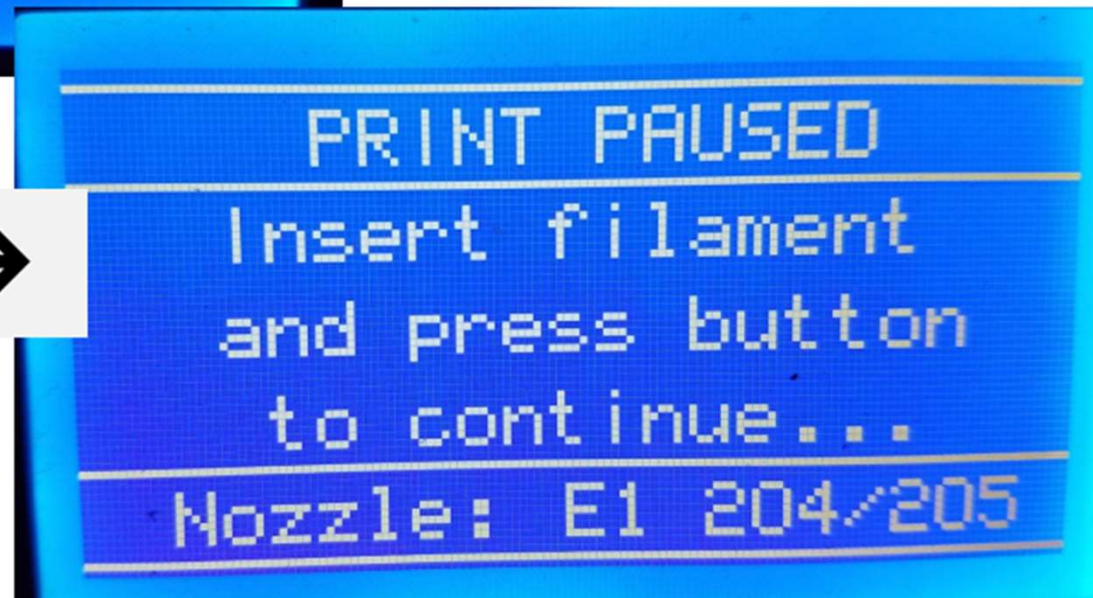


Wait for Extruder Heating

pull out filament

insert different color

BEEPS here →



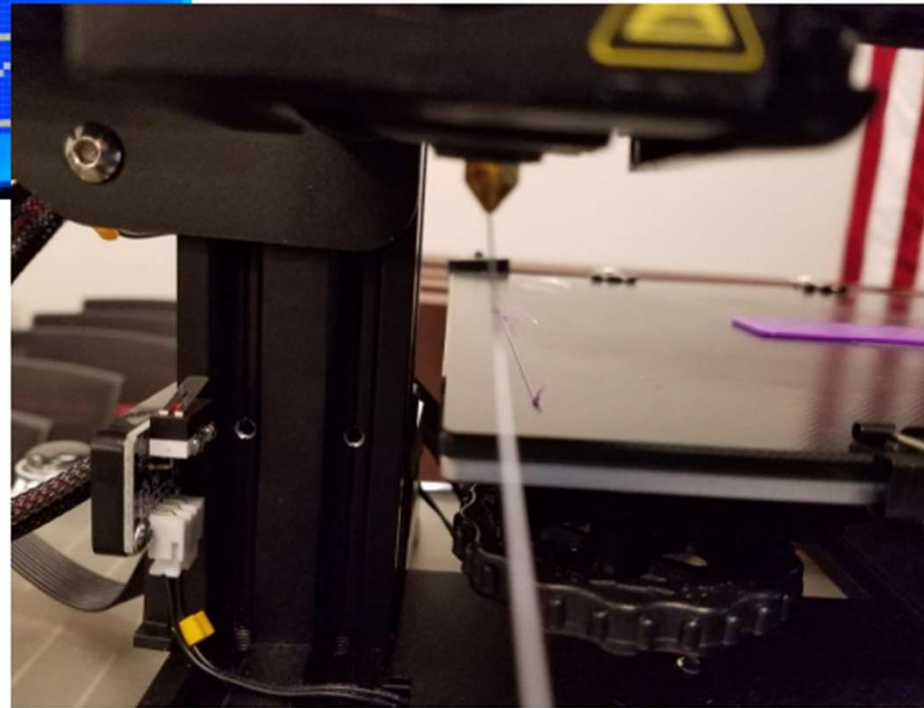


Marlin Reference for M600

TWO COLOR WORKFLOW 2023



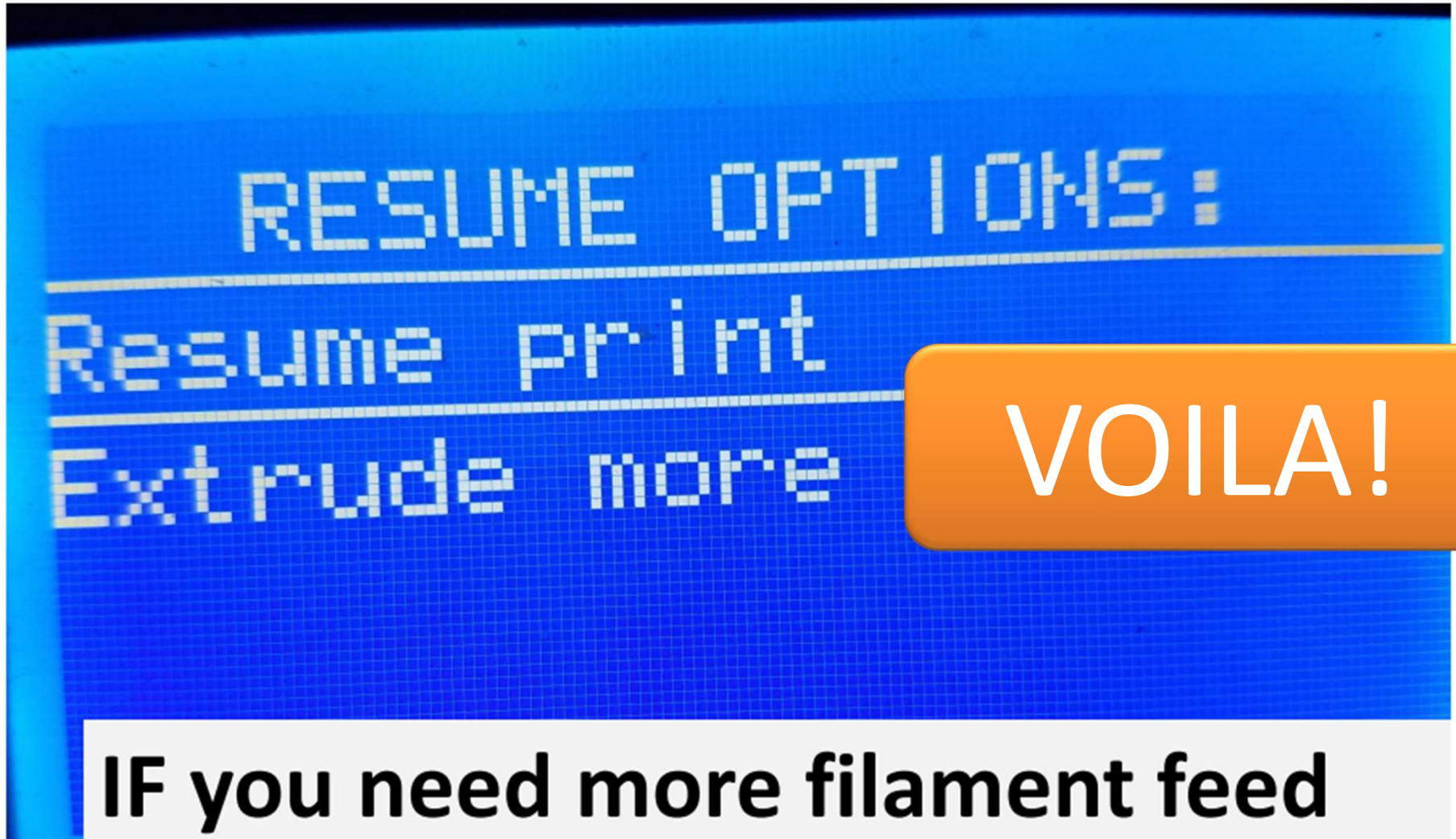
Purge new color





Keep purging if needed, then resume

TWO COLOR WORKFLOW 2023



**IF you need more filament feed
you have the option!**

M600 in Cura

TWO COLOR WORKFLOW 2023

CE3E3V2_Fidget Cubept5 - Ultimaker Cura

File Edit View Settings Extensions Preferences Help

Ultimaker Cura

- Update Checker >
- Cura Backups >
- Post Processing >

PREPARE

PREVIEW

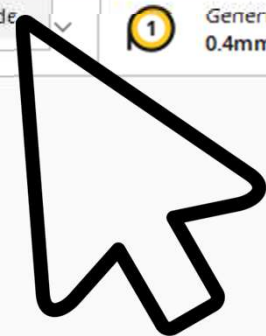


Creality End

Modify G-Code



Generic PLA
0.4mm Nozzle



M600 in Cura

TWO COLOR WORKFLOW 2023

CE3E3V2_Fidget Cubept5 - Ultimaker Cura

File Edit View Settings Extensions Preferences Help

Ultimaker Cura

PREPARE

PREVIEW

MONITOR



Creality Ender-3



Generic PLA
0.4mm Nozzle



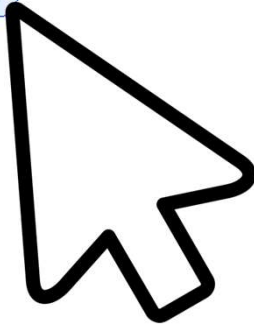
Post Processing Plugin

Post Processing Scripts

Settings

Add a script

Close





M600 in Cura

TWO COLOR WORKFLOW 2023

The screenshot shows the Ultimaker Cura software interface. At the top, there is a menu bar with 'File', 'Edit', 'View', 'Settings', 'Extensions', 'Preferences', and 'Help'. Below the menu bar is a dark blue header with the 'Ultimaker Cura' logo and three buttons: 'PREPARE', 'PREVIEW', and 'MONITOR'. The main interface area shows a 3D model of a printer bed with a grid. On the left side, there is a vertical toolbar with various icons. In the top right corner of the main interface, there are two dropdown menus: 'Creality Ender-3' and 'Generic PLA 0.4mm Nozzle'. A 'Post Processing Plugin' window is open in the foreground, displaying a list of settings. A large black mouse cursor is pointing at the 'Filament Change' option in the list. The window has a 'Close' button in the bottom right corner.

CE3E3V2_Fidget Cubept5 - Ultimaker Cura

File Edit View Settings Extensions Preferences Help

Ultimaker Cura PREPARE PREVIEW MONITOR

Creality Ender-3 Generic PLA 0.4mm Nozzle

Post Processing Plugin Settings

- ChangeAtZ 5.3.0(Experimental)
- ColorMix 2-1 V1.2.1
- Create Thumbnail
- Display Filename And Layer On LCD
- Display Progress On LCD
- Filament Change
- Insert at layer change
- Pause at height
- Retract Continue
- Search and Replace
- Post stretch script
- Time Lapse
- Use Previous Probe Measurement

Close



M600 in Cura

TWO COLOR WORKFLOW 2023

CE3E3V2_Fidget Cubept5 - Ultimaker Cura

File Edit View Settings Extensions Preferences Help

Ultimaker Cura PREPARE PREVIEW MONITOR

Creality Ender-3 Generic PLA 0.4mm Nozzle

SET LAYER to CHANGE AT HERE

Post Processing Plugin

Post Processing Scripts

Filament Change

Add a script

Filament Change

Layer	1
Use Firmware Configuration	<input type="checkbox"/>
Initial Retraction	30.0 mm
Later Retraction Distance	300.0 mm
X Position	0.0 mm
Y Position	0.0 mm
Z Position (relative)	0.0 mm
Retract method	Marlin (M600 U)

Close



M600 in Cura

Post Processing Plugin
✕

Post Processing Scripts

Display Filename And Layer On LCD [-] [v] [x]

Flament Change [-] [v] [x]

Add a script

Filament Change

Layer	94
Use Firm...guration	
Initial Retraction	30.0 mm
Later Ret... Distance	300.0 mm
X-Position	0.0 mm
Y-Position	0.0 mm
Z-Position (relative)	0.0 mm
Retract method	Marlin (M600 U) ▾