

SRS
HSW process changes
for
Objet 3-D Printers
Triplex machines family

Software Requirements Specification

	Name	Date
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1. Overview

The Triplex machine will operate (like the Connex machine) in HS, HQ and DM modes, but unlike the Connex, 2 of the printheads (S0, S1) will operate in either Model or Support material. The HSW, in order to avoid the cumbersome process of material replacement, will print on this heads the weight test of the present material, and the voltage for the second material (Model or Support) will be calculated and updated.

2. Objectives

- 2.1. Build a mechanism into the HSW to facilitate the voltage calculation for the alternative material.
- 2.2. The above mentioned mechanism will be integrated into the current SHR.
- 2.3. The voltage for the alternative material will be based on test results obtained by the HSW for the existing material.

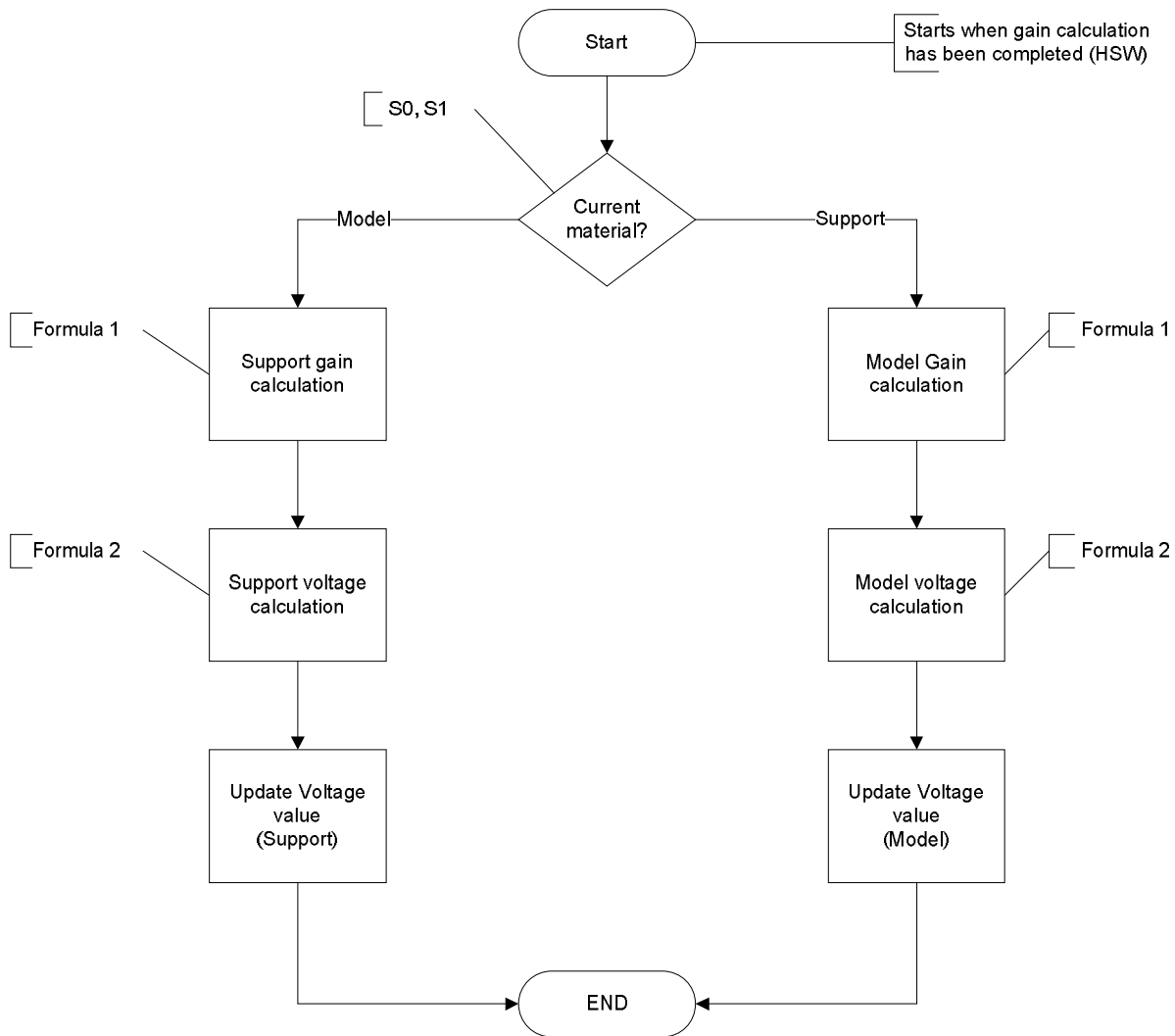
3. Implementation

3.1. Process

The process starts after the gain has been calculated for all heads and for all modes in the HSW.

Following is the process flow chart:





As seen on the flow chart, the voltage is calculated for the material that is currently not used by the 2 heads.



3.2. New parameters

Name	Value	Notes
Correction_factor_HQ	0.239	
Correction_factor_HS	0.303	
S0_voltage_M(S)_HQ	As calculated	For the support
S0_voltage_M(S)_HS	As calculated	same parameters may be used
S1_voltage_M(S)_HQ	As calculated	
S1_voltage_M(S)_HS	As calculated	

Note that for each of the 2 heads, 4 voltage values are required instead of 2 so far.

3.3. Formulae

3.3.1. Formula 1 (gain calculation)

$\text{Support_gain_HQ} = \text{Gain_Model_HQ} + \text{Correction_factor_HQ}$

$\text{Support_gain_HS} = \text{Gain_Model_HS} + \text{Correction_factor_HS}$

By using the same formulae, the Model gain can be calculated.

The calculated gain will be used to calculate the target voltage of the alternative material.

3.3.2. Formula 2 (voltage calculation)

$S(0,1)_voltage_HQ = V_current(HQ) + (\text{target_layer}(HQ) - \text{current_layer_HQ}) / \text{gain_HQ}$

$S(0,1)_voltage_HS = V_current(HS) + (\text{target_layer}(HS) - \text{current_layer_HS}) / \text{gain_HS}$

Note:

3.3.2.1. all layer values are gross – before roller

3.3.2.2. Conversion of layer from net to gross is already done in the HSW

