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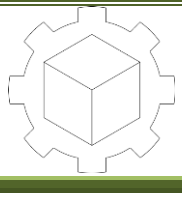

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Date of Issue: 3.12.2017	To: Internal Doc.	Attn.: CEO	Attach.: No
SUBJECT: Tech. Report, Ash Percent of Sizan Filament		CC: N/A	Page: of 5

TECHNICAL REPORT

Measurement of the Ash Percent of SIZAN CO's PLA Filament

Testing and Verification by: Ahsan Moharramkhani

Under Supervision of: Mohammad Olamai

Document No.: TR-3DP-001

December, 2017

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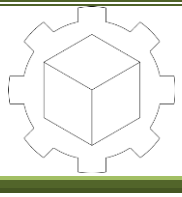

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Description

To make a successful casting by means of a single-use pattern, it's needed to consider the residual ash scum within the mould once the melt fills in the mould cavity completely. The amount gets us to provide enough space on top of cavity and mount proper vent to let out smokes and ashes. In this work, we arranged a set of tests to obtain trustable data for calculations carried out on the filament produced by Sizan Pardazesh Kavir Company.

The Experiment Procedure

Following steps shall be carried out respectively and the quantities of germs and dimensions must be measured thoroughly and then factors of volume, densities and percentage of remaining ash after burning calculated implementing sufficient decimal digits:

- Picking a piece of wire from the filament reel as the specimen
- Weighing the specimen
- Measuring length of the wire
- Measuring the wire diameter
- Burning out the specimen
- Doing calculations

Correlations

Longitudinal Density: $\rho_v = \frac{M}{L}$

Volume: $V = \frac{\pi d^2 L}{4}$

Volumetric Density: $\rho_l = \frac{M}{V}$

Ash Percent: $a = \frac{m}{M}$

Test Outcomes

According to the above correlations and the quantities measured and tabulated below, we have found the ash percent as 2.6%.

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Item	Symbol	Amount	Unit	Remark
Germ of Specimen	M	10.000	g	± 1 mg
Length	L	3499.8	mm	unstressed
Diameter (Nominal)	D_{nom}	1.75	mm	
Diameter (Actual)	d	1.803 (average)	mm	Ovality 5.5 %
Density (Longitudinal)	ρ_l	2.8573	g/m	
Density (Volumetric)	ρ_v	1.119	g/cm^3	
Germ of Ash	m	0.26	g	± 5 mg
Ash Percent	a	2.6	%	

Acknowledgement

Herewith we offer appreciations to Mr. Javad Nikoukar for his assistance and providing valuable information and counsel.

Pictures

Following pictures show the research outline.

Specimen

Burning

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Burning out

Ash recovery

Ash

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Weighing