Comparison of two desiccators (heating at IR and halogen) with silicone suds

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Introduction

Bluestar Silicones makes silicone for both medical and industrial applications. This training period consisted in comparing two types of desiccators by means of suds of silicone in order to replace the desiccators with IR heating by the desiccators with halogen heating.

Experimental methods

The first desiccator was a "Mettler-Toledo" with IR heating. The second was a "Mettler-Toledo" modal HR83 with halogen heating.
Tests were conducted on two desiccators at the same time, under the following conditions: 1.5g ±0.2g of suds containing SiH and 2g ± 0.2g for the other. The work temperature was 150°C (With the halogen desiccator, we took the ramp 3, so temperature rose during 3 minutes to achieve 150°C). The duration of the experiment was 30 minutes. A study at 60 minutes was also made to see the stabilization of the dry matter. 100mm and 60mm diameter aluminium cups were used, glass fiber filters (for a better distribution of the sample in the cup) and Pasteur pipettes of 3mL.

Statistical approach

In this study, the two desiccators were compared with all suds produced by the firm, analyzing dry matter twice for IR (priority on the manufacture for testing) and six times for halogen. To compare these desiccators, we used test of comparison of variance and a test for equality of average.

Results and discussion

According to Fig.1, we saw that the halogen heating units gave results lower than IR. But we could see in Fig.2, the averages between the two desiccators were very close.
Moreover, tests confirmed the earlier observation (Table.1).
$F_{obs} < F_{the}$ proved the equality of variance and $w < 3$ confirmed the equality of averages.

Conclusion

To sum up, both analysis methods generally gave the same results. However, we opted for the method with halogen heating because it provided a good value with a temperature ramp compared to IR where we do not know the temperature in real time. It prevented the operator from restarting an analysis without the device being cooled completely: it avoids errors on the results.

Fig.1 : graphic about analysis of one duds
Fig.2 : graphic about the averages
Table.1 : Values of tests

Fig.1

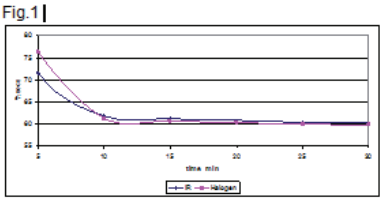

Fig.2

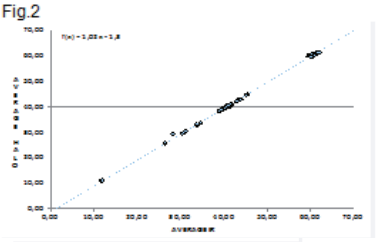

Table.1

	s^2
IR	122.64
Halogen	127.17

$\bar{y}$	$s(\bar{y})$	w
0.545	0.411	1.33

F_{obs}	F_{the}
1.04	1.47

$\bar{y}$: average of difference between average of IR and halogen

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