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INSTITUTE OF ENGINEERING; UNIVERSITY OF ALGARVE; CAMPUS DA PENHA; FARO-PORTUGAL

"DESIGN, CONSTRUCTION AND COMPARISON OF SOLAR VACUUM DRYER AND CONVENTIONAL SOLAR CABINET TYPE DRYER"

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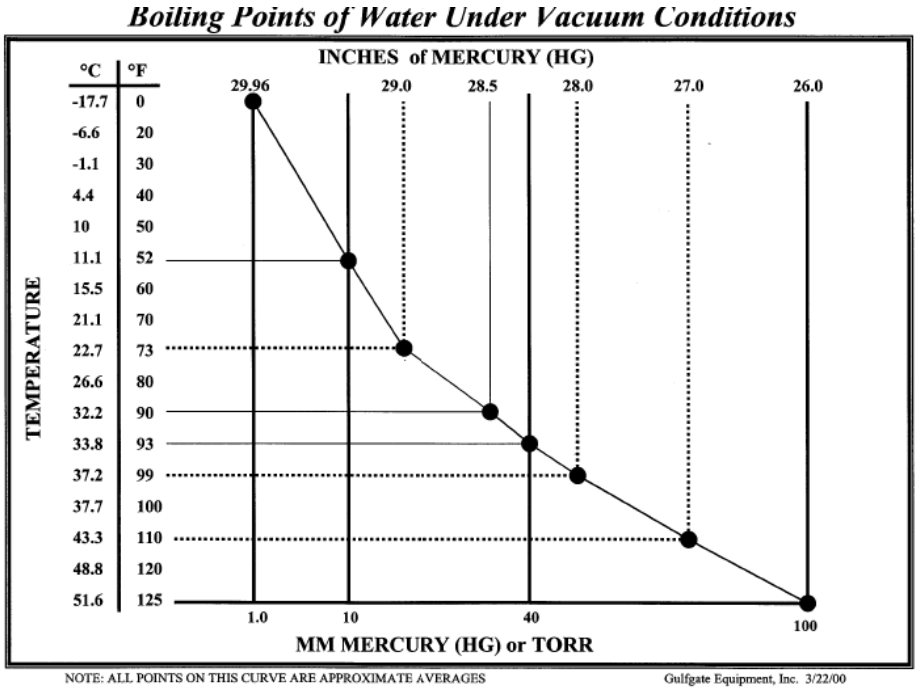
Introduction

Less boiling point temperature could help to conserve some properties and nutrients of food.



Experimental Design

Design → SolidWorks 2019

Mechanical Modelling →

Construction

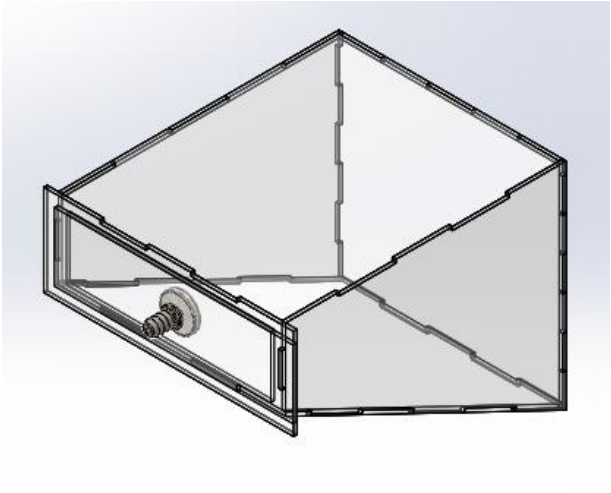
Testing →
- Solar Vacuum Dryer
- Conventional Solar Cabinet Dryer
- Electric Dryer Oven

Davis Instrument® modelo Vantage Pro Inalámbrica

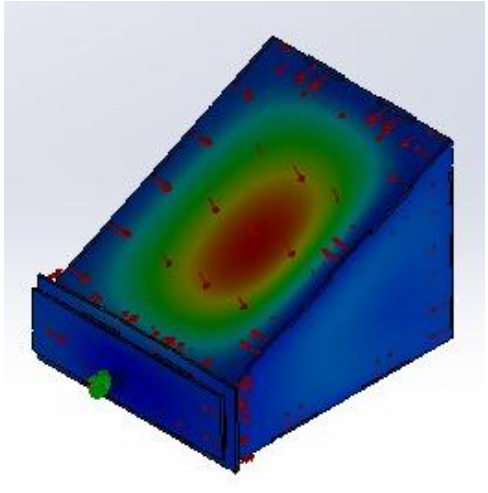
BUCHI V-100 Vacuum Pump

SHEL LAB SMO14-2

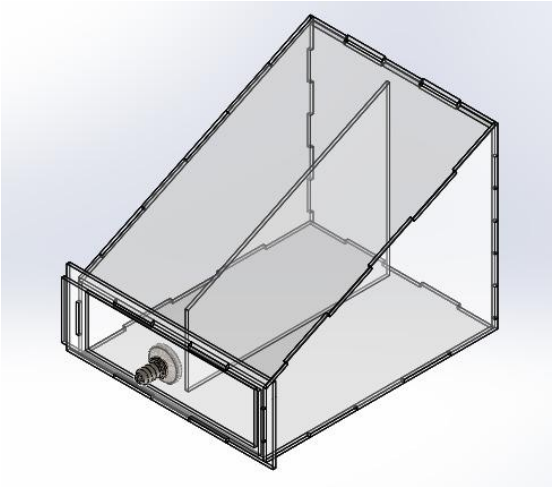
Design

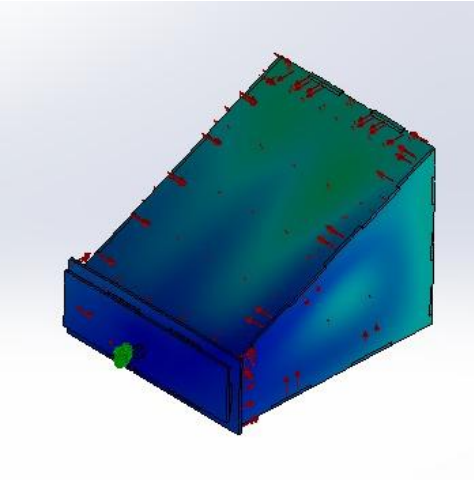


- Acrilic 3mm
- 20cm x 28cm x 25cm



The model Will only resist 3.2kPa of vacuum pressure.





The model will resist 30 kPa of vacuum pressure.

Construction

Testing

Oregano % of humidity → 52.58%

Test	Time	Vacuum Pressure	Power Consumption	Irradiance	% of Humidity
Solar Vaccum Dryer	1 hour	21.5 kPa	70W	657w/m^2-468w/m^2	**65.0%**
Conventional Solar Cabinet Dryer	1 hour	---------	---------	657w/m^2-459w/m^2	**80.5%**
Electric Dryer Oven	1 hour	---------	997W	---------	**87.6%**

Conclusion

To incorporate Vacuum to the solar dryer process, seems to be a good option in order to accelerate the process by reducing the boiling point.

THANK YOU !!!
GRACIAS !!!
OBRIGADO!!!