

**A FIELD TRIAL – USING A HEAT TRAP, INSULATION AND HEAT
SINKS WITH A 1.8m PARABOLIC SOLAR CONCENTRATOR TO
ATTEMPT THE PIZZA OVEN CHALLENGE AT LATITUDE 32S**

Andrew Wilson BAppSc

Private Project in Perth, WA, Australia

moguls3@westnet.com.au

With expert guidance from

Dr Celestino Ruivo, Universidade do Algarve, Faro, Portugal

and Dave Oxford, SLiCK Solar Stove, UK

cruivo@ualg.pt

daveoxford@metronet.co.uk




**Simple and readily
available equipment...**



...producing small quantities
of food with little effort

(requires a very hot day!)



(Collector based on the
design by Dr Celestino
Ruivo)

**A little more complex, more
powerful, but still very cheap...**



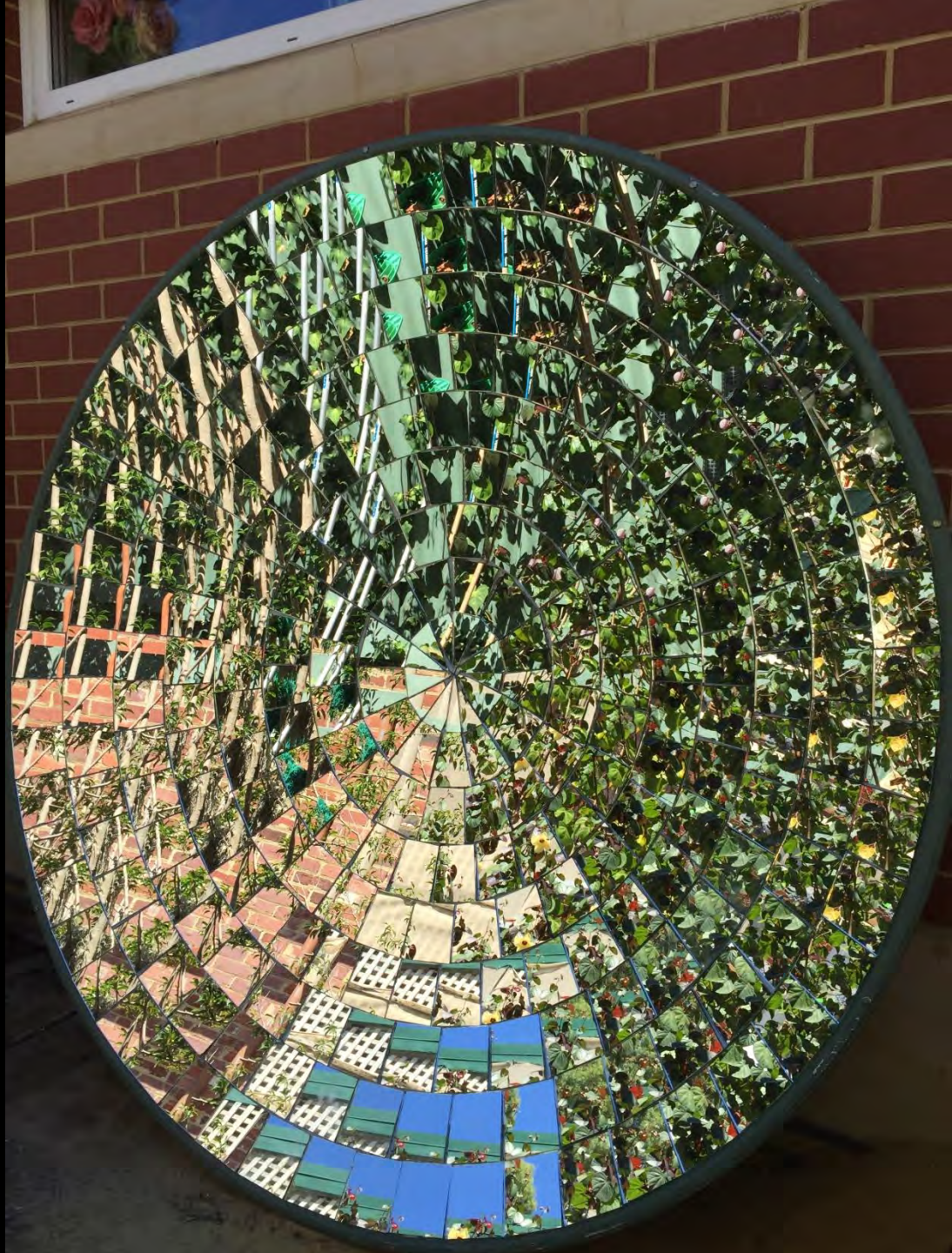
... but (with a heat trap) produces a nicely browned cake



1.8m parabolic radio dish



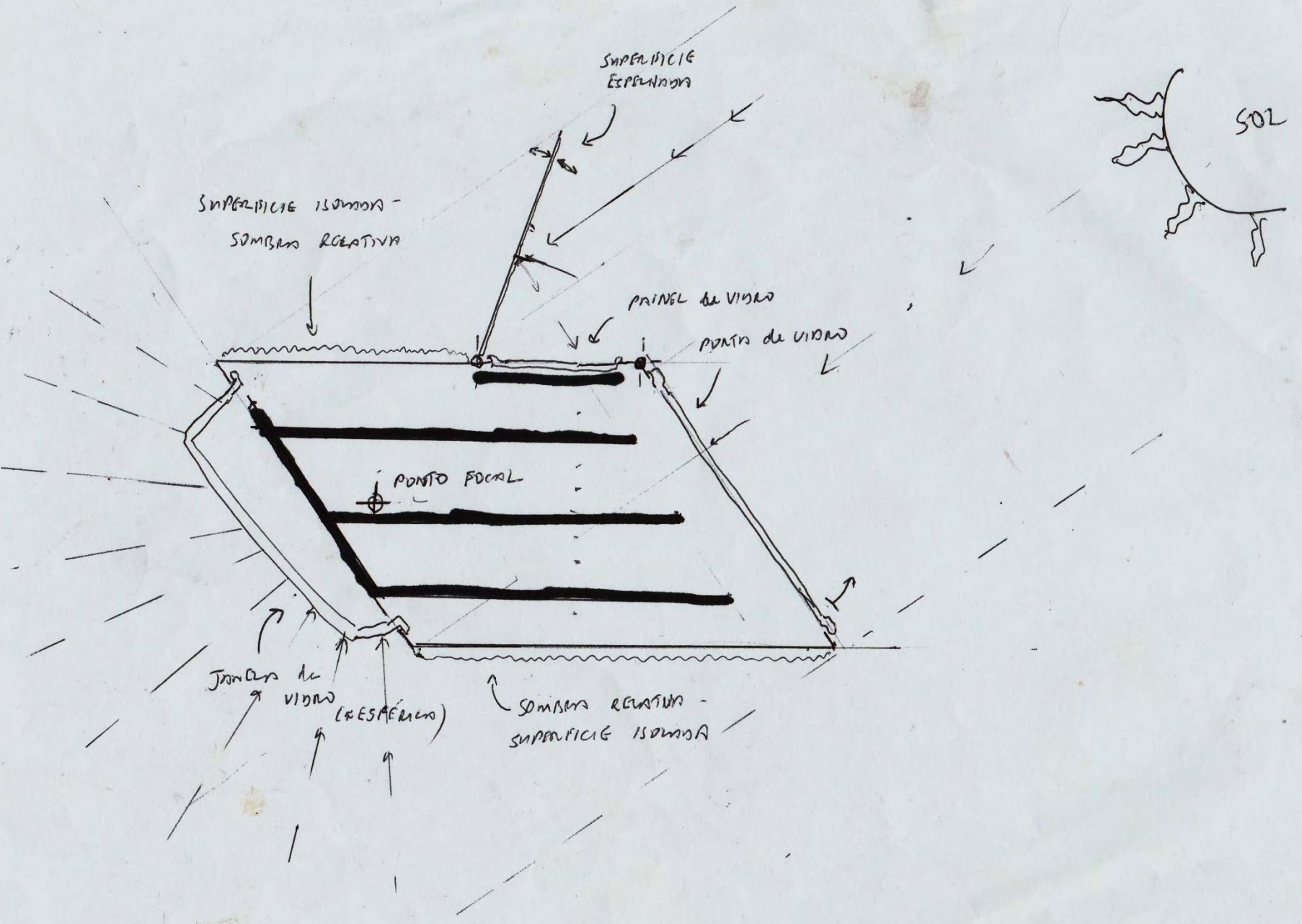















Double-glazed window









Compressed Mineral
Fibre Sheet Insulation



Aluminium
Flashing







22/09/2019

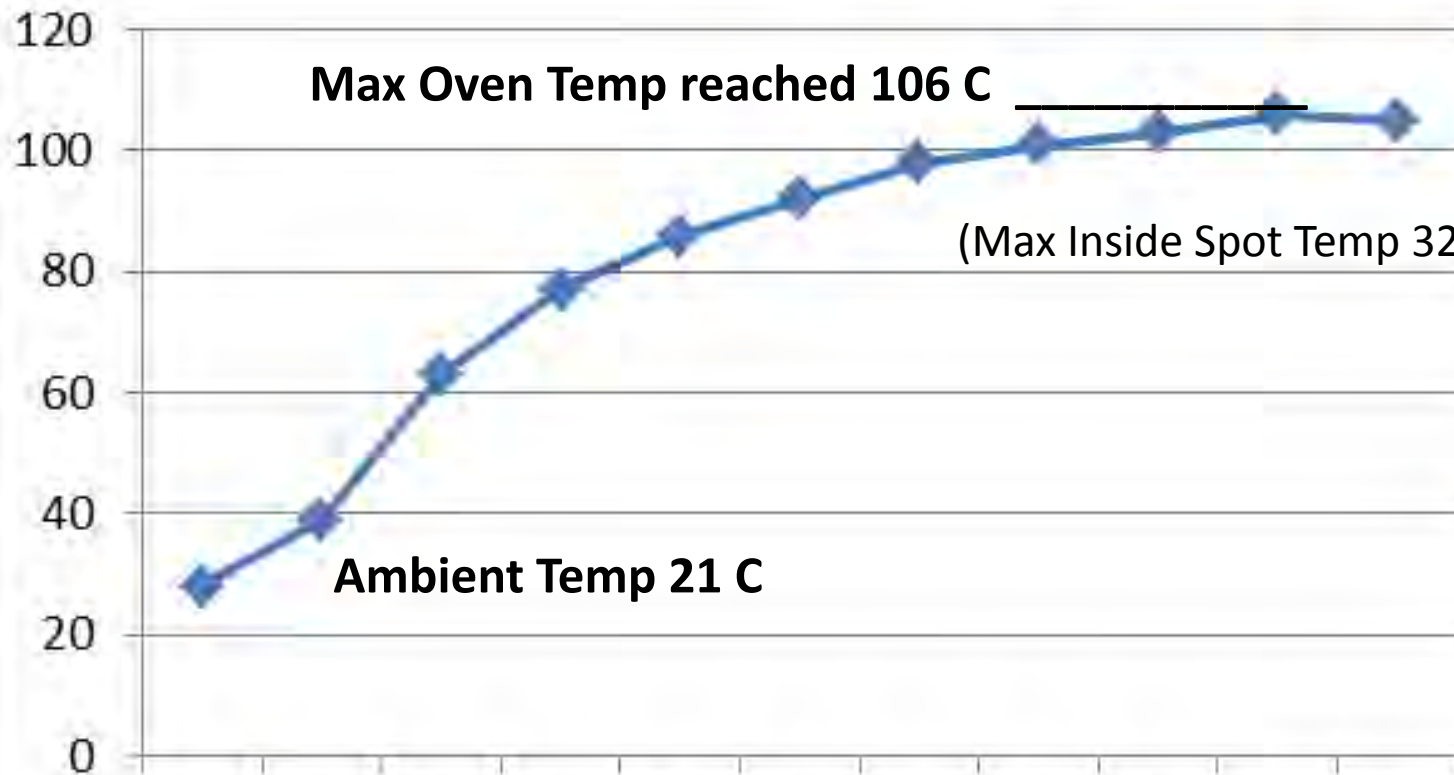
Max Oven Temp reached 106 C

(Max Inside Spot Temp 325 C)

Ambient Temp 21 C

14:48 14:55 15:06 15:15 15:22 15:28 15:32 15:36 15:40 15:48 16:01

Temp C



This gained 10 degrees to 116 C

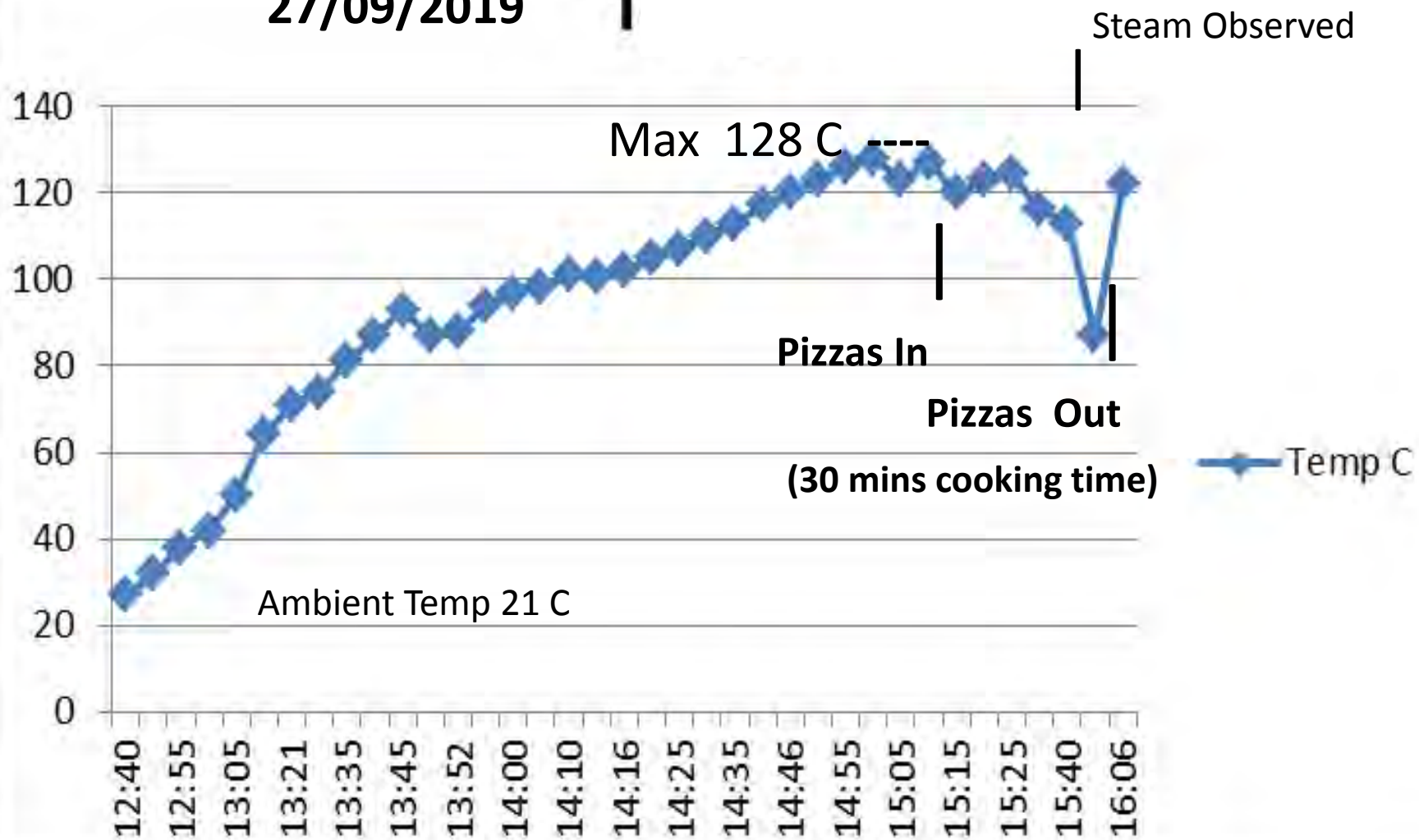


Changes-

- The secondary mirror was abandoned for all subsequent trials
- The parts of the suspension bars external to the oven were wrapped with towelling
- The double-glazed door was replaced with a single sheet of the insulation board

27/09/2019

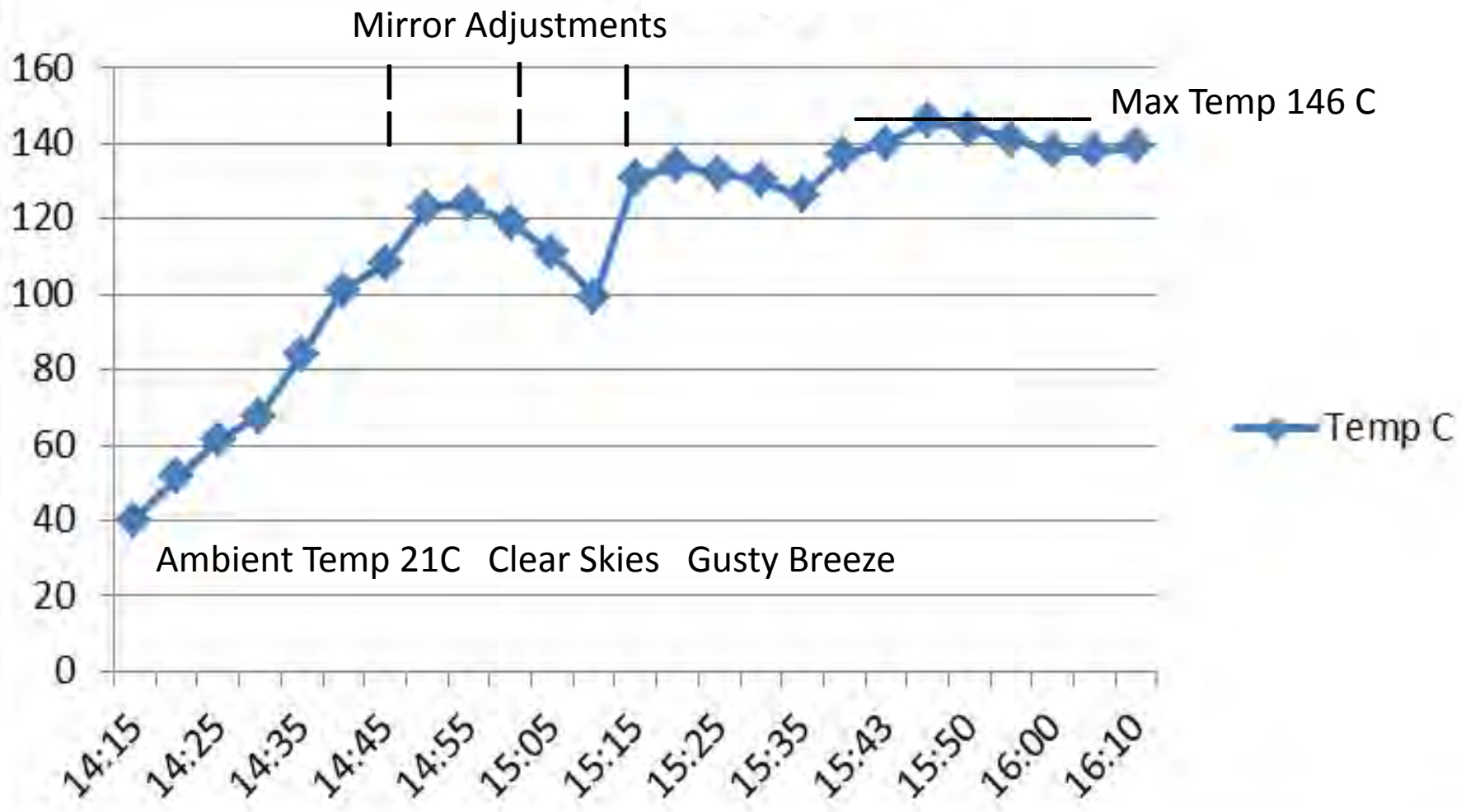
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Changes-

- A 150mm aperture was cut into the back of the oven to allow light directly into the cavity
- The 330mm washing machine lid and the insulation-sheet door were retained

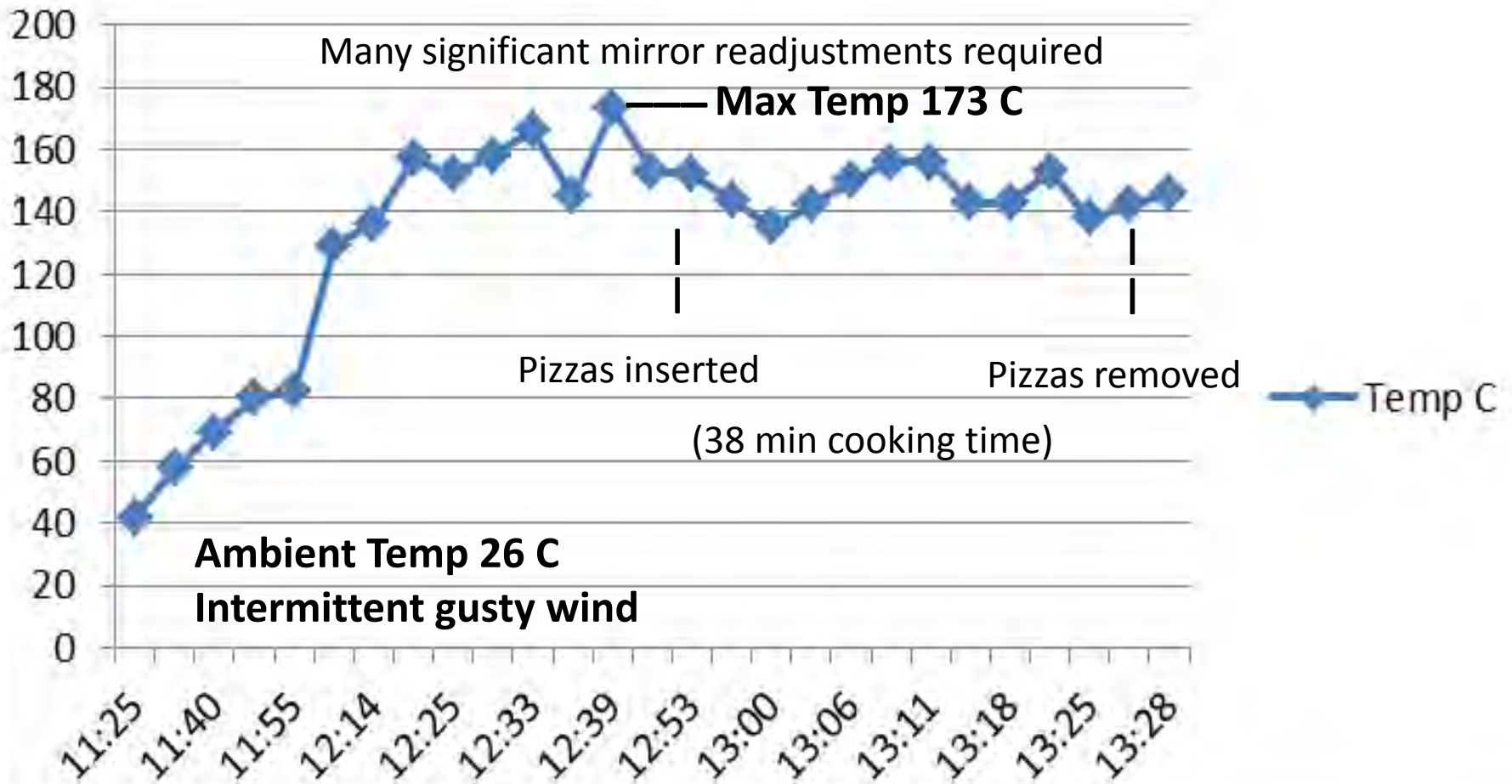
28/09/2019



Changes-

- A smaller (180mm dia) glass bowl was used as the heat trap.
- The rear-wall insulation had accordingly been replaced to fit.
- Three pizzas were used but they were 12" (300mm) due to lack of availability of the larger size.
- The sheet of insulation was retained as the oven door.

19/10/2019









Changes-

- Extensive repair of all insulation, including adding a second layer to roof, careful caulking of gaps and taping joints
- Support bars insulated with towelling inside and outside the oven. Inside the oven, they were further wrapped with reflective aluminium sheet.
- Support bars stuffed with mineral fibre insulation to prevent air flow-through



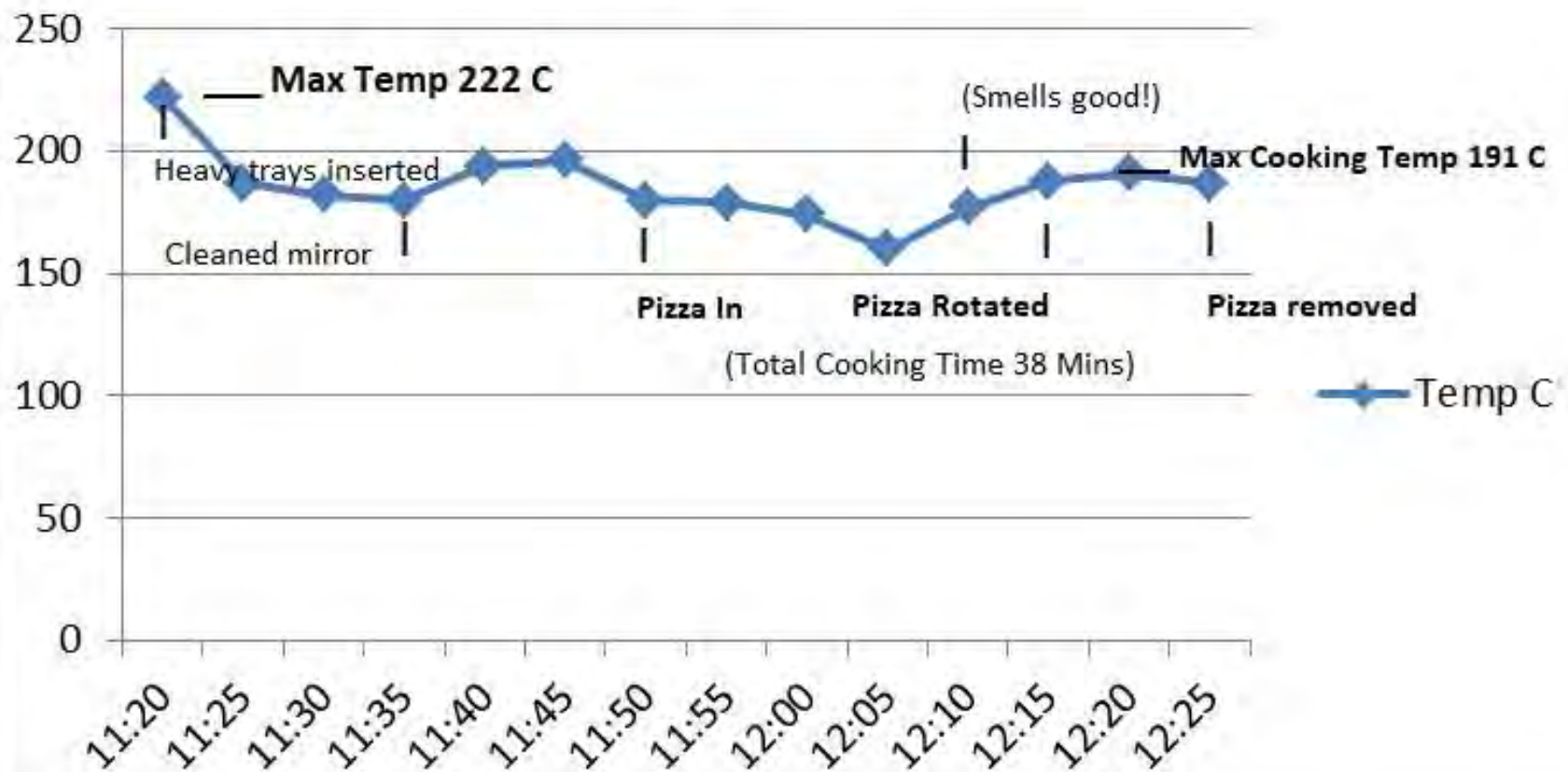


Tubes insulated and covered with aluminium sheet





Trial 5 08/11/2019





Discussion- (+)'s

- Cooking pizza can be done with this apparatus
- The same apparatus could be used for cooking items too large for a pot that do not require such high temperatures

Discussion- (-)'s

- Cooking pizza is at the limits of the ability of this apparatus. It requires accurate re-aiming every few minutes.
- It requires good ambient conditions.
- Cooking naan is probably out of reach.
- It is quite big and heavy and took a lot of resources to build

Suggestions-

- Further improve the general insulation
- Insulate the oven from its supports
- A better-designed oven door would retain more heat
- Place the heat trap beneath the oven
- Reduce the oven's surface area
- Use 'shadow-compensating' mirror(s)?

CONCLUSION

With the achievement of empty-oven temperatures in excess of 200C and with the cooking including browning of pizza with this apparatus within the official spring, the author claims 'proof-of-concept'.

However-

The cooking of larger quantities of pizzas and other flatbreads with this apparatus is possible, but not truly practical.

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THANK YOU !

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