ECONO-HEAT

Comparative Tests

Electrical Room Heaters

Report 1

1. Introduction

This document describes a series of tests that were performed to compare the Econo-Heat Wall Panel Heater against other electrical room heaters in terms of performance.

The tests were performed in the dedicated Test Room at the Econo-Heat factory in Cape Town, South Africa.

2. Test Candidates

The following heaters were tested (see Appendix A for further details):

a. Econo-Heat Panel Heater, Wall-mounted, Convection Heater

b. Brand name A, Halogen Radiant Heater

c. Brand name B, Fan Heater

d. Brand name C, Wall-mounted, Convection Heater

e. Brand name D, 9-fin Oil-filled Heater

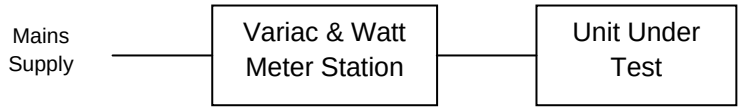
f. Brand name E, Radiant Panel Heater, Free Standing

g. Brand name E, Radiant Panel Heater, Wall-mounted

3. Test Description

The aim of the test was to compare the transient performance of the heaters in terms of room temperature rise, rate of temperature rise and time to reach a steady state value.

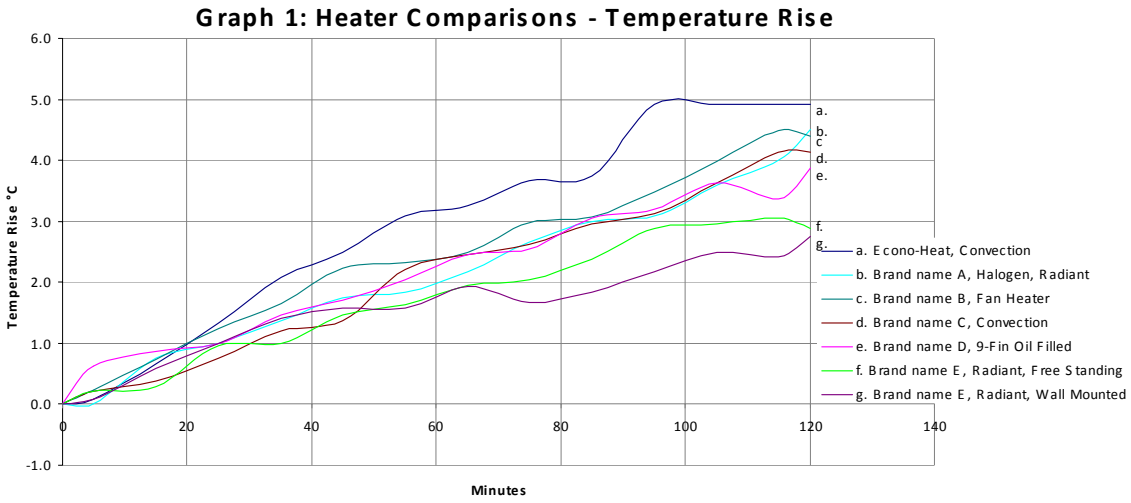
A 425 W Econo-Heat wall panel heater was tested against five heater types, each running at 425 W. This was achieved by varying the supply voltage to ensure that all heaters were operated at the same power as shown in the following diagram:

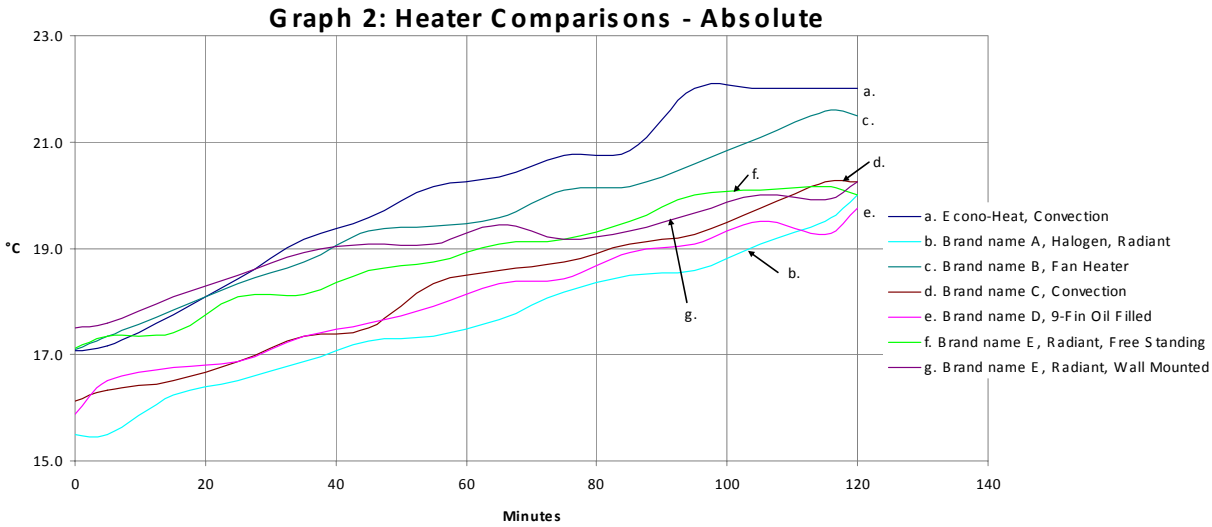


The tests were performed in a Test Room that is a “room within a room”. The Inner Room was cooled down to an average of 16.5 °C as a starting point for the tests, whilst the temperature in the Outer Room was kept between 15 and 16 °C. Each heater was then run for two hours.

4. Test Results

The following graphs illustrate the test results for each heater:





Notes on the test conditions and results:

a. As a more meaningful comparison, Graph 1 shows the heat rise achieved by each heater above a nominal starting point, which was on average 16.5 °C.

b. Graph 2 shows the absolute temperatures achieved during the tests. Note that the actual starting points of the tests varied between 15.5 and 17.5 °C.

c. The test duration was 2 hours for each heater.

d. The measurement resolution is 0.25 °C, with an accuracy estimate of ± 0.5 °C.

e. Approximate Inner Room dimensions: area = 11 m^2 and volume = 27 m^3.

f. Approximate sensor location: Centre of room at a height of 1.3 m above the floor.

g. The Outer Room, representing a typical outdoor ambient temperature, was kept to a temperature of about 15 to 16 °C for the duration of each test.

5. Conclusions

The tests show the comparative performance of each room heater in terms of its transient characteristics, including the heat rise achieved above starting temperature, the rate at which this occurred and the time it took to reach steady state temperature. Note should be taken of the test environment and test conditions described above.

The tests were limited to two hours each for practical reasons, but experience has shown that most heaters achieve steady state within this time period. All heaters were tuned to the same wattage of 425 W to ensure a like comparison, even though there is a wide spread in the ratings of the various heaters.

From the test results it would appear that convection heaters performed better than the radiant heaters.

6. APPENDIX A – Heater Details

This section provides some detail on the heaters used for the test:

a. Econo-Heat Panel Heater

This is a cement-fibre, wall-mounted, convection heater rated at 230 V, 425 W.

b. Brand name A, Halogen Radiant Heater

This heater is of a plastic construction with three halogen bars of 400 W each. It further features a rotation function and tip-over cut-out switch.

c. Brand name B, Fan Heater

This heater is of a plastic construction, using a fan to deliver up to 2000 W in two settings. It has a rotate function and a thermostat.

d. Brand name C, Wall-mounted, Convection Heater

This is a fibre panel, wall-mounted convection heater rated at 240 V, 420 W.

e. Brand name D, 9-fin Oil-filled Heater

This is a 9 fin, oil-filled heater rated at 230 V, 2000 W.

f. Brand name E, Radiant Panel Heater

This is a radiant panel heater that was tested both in a free standing and in a wall-mounted configuration. It is rated 220 V, 450 W.