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Hunter Pacific International invests heavily in research, development, performance and quality testing of its products. Routinely we measure and compare the performance of competing products as part of our product development process. This document is the summarised version of the complete benchmarking test report we compiled between February and August 2009. The full version may be downloaded from our website.

# Airflow Measurements – the Figures

The table below and the graph on the following page shows the airflow measured for seven 52" (1320 mm) fans aimed at the same market segment. The Hunter Pacific Concept 1 & 2 fans demonstrate they have been designed to achieve a high level of airflow and clearly out-performed the other units we tested. Apart from the Optima and Intercept there is little difference between the other units.

| Brand | Fan Model | Fan Speed | RPM | Power (W) | Efficiency [(m³/h)/W] | Average Efficiency | Flow Rate (m³/h) | Average Airflow(m³/h) |
|---|---|---|---|---|---|---|---|---|
| | Concept 1 & 2 | High Speed | 206.25 | 63.04 | 107.4 | | 6771 | 50.86 |
| Hunter Pacific | | Medium Speed | 150.08 | 31.48 | 154.7 | 14.9 | 4871 | |
| | | Low Speed | 116.13 | 19.48 | 185.6 | | 3616 | |
| | | | | | | | | |
| | Optima | High Speed | 204.50 | 62.90 | 106.5 | | 6699 | 49.50 |
| Lucci | | Medium Speed | 149.25 | 31.47 | 153.7 | 14.4 | 4838 | |
| | | Low Speed | 114.88 | 19.43 | 170.5 | | 3313 | |
| | | | | | | | | |
| | Intercept | High Speed | 203.20 | 65.79 | 100.4 | | 6605 | 50.30 |
| Intercept | | Medium Speed | 148.50 | 31.07 | 160.2 | 14.8 | 4978 | |
| | | Low Speed | 112.65 | 19.20 | 182.7 | | 3507 | |
| | | | | | | | | |
| | Futura | High Speed | 196.67 | 52.00 | 116.8 | | 6075 | 46.25 |
| Lucci | | Medium Speed | 150.50 | 31.23 | 147.8 | 14.4 | 4617 | |
| | | Low Speed | 107.83 | 19.03 | 167.2 | | 3182 | |
| | | | | | | | | |
| | Lifestyle | High Speed | 191.67 | 60.30 | 97.7 | | 5892 | 41.80 |
| Martec | | Medium Speed | 133.83 | 30.83 | 129.7 | 12.7 | 3999 | |
| | | Low Speed | 95.50 | 17.20 | 154.0 | | 2648 | |
| | | | | | | | | |
| | Hunter Sonic | High Speed | 164.33 | 55.28 | 103.2 | | 5705 | 44.52 |
| Prestige | | Medium Speed | 130.08 | 37.40 | 121.7 | 12.7 | 4553 | |
| | | Low Speed | 73.00 | 19.80 | 156.5 | | 3098 | |
| | | | | | | | | |
| | Grange | High Speed | 175.00 | 46.83 | 118.8 | | 5564 | 42.47 |
| Mercator | | Medium Speed | 127.17 | 24.63 | 158.1 | 16.9 | 3895 | |
| | | Low Speed | 88.67 | 14.33 | 229.0 | | 3281 | |

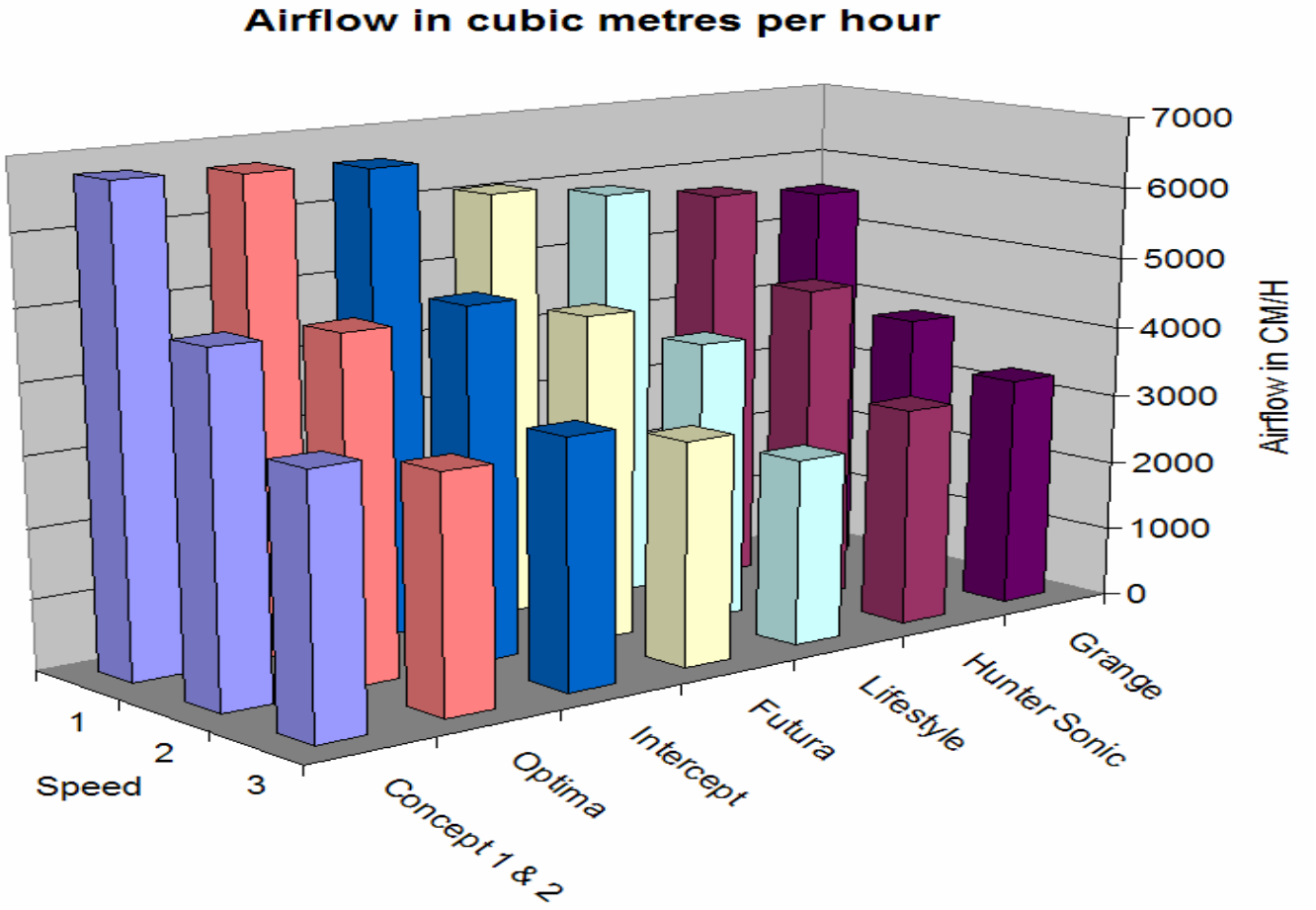
No matter how well a ceiling fan performs under laboratory conditions, to obtain the best in-situ performance, it must be accurately selected for the room size and type of ceiling. Contrary to popular belief, bigger fans are not always better as there must be enough room around and above the circumference of the fan blades to allow air to be drawn in. Room shape, size, design and fan location are all equally important factors to take into consideration.

Body and blade materials must be carefully selected for suitability with the household environment. Ceiling spaces can collect and retain steam from kitchens and bathrooms quite some distance from the fan location. Moisture from this and other sources (e.g. outside) will condense on metal parts and may require increased maintenance to combat corrosion in metal parts or perhaps reduce the life of timber blades.

# Airflow Performance Measurement – the Facts

To accurately and credibly measure ceiling fan airflow to a standardised method; controlled testing environment, experienced staff and high quality, sophisticated instrumentation is required. Hunter Pacific uses the Energy Star Solid State Test Method, which is the only method accepted by the EPA in the USA for regulatory testing of ceiling fan energy efficiency. Airflow figures are often incorrectly or poorly measured by manufacturers and misquoted by distributors. The full version of this document covers the subject in more detail and both sales staff and customers may benefit from reading it.

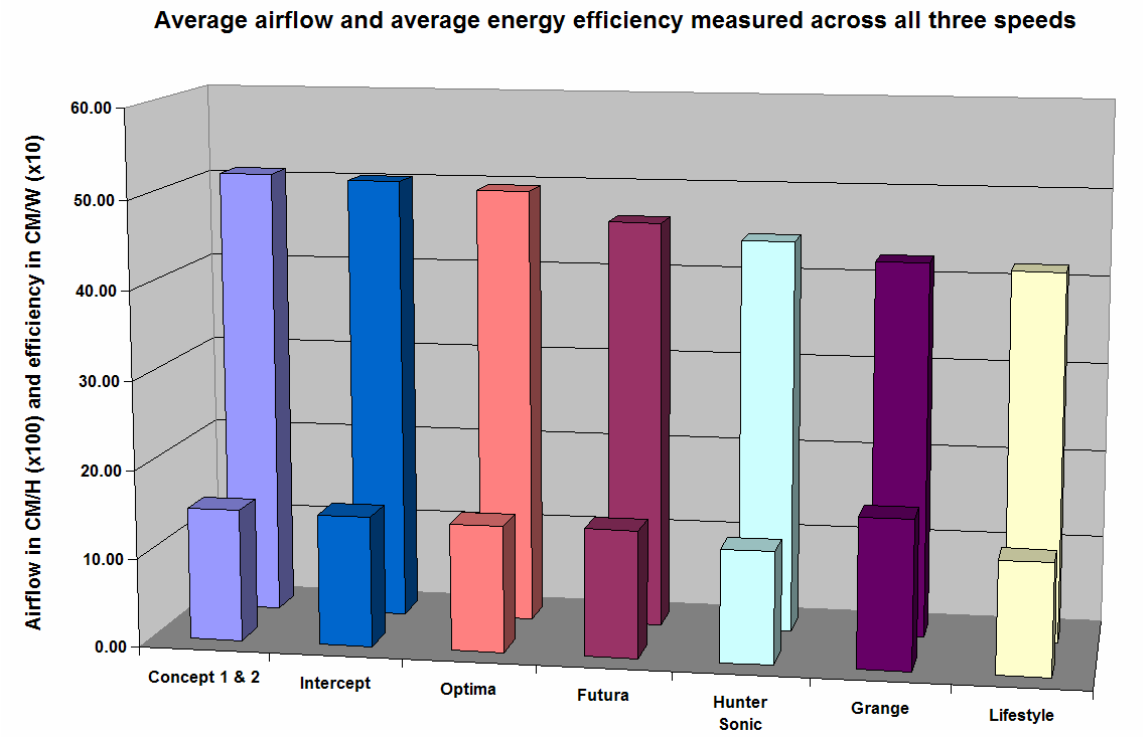
The results in this document have been drawn from the benchmarking segment of our long-term research program into ceiling fan performance and energy efficiency. Airflow can be quickly compared from the following graphic depicting fan performance across all three speeds and from the average airflow figure given in the preceding table.




# Energy Efficiency of Ceiling Fans

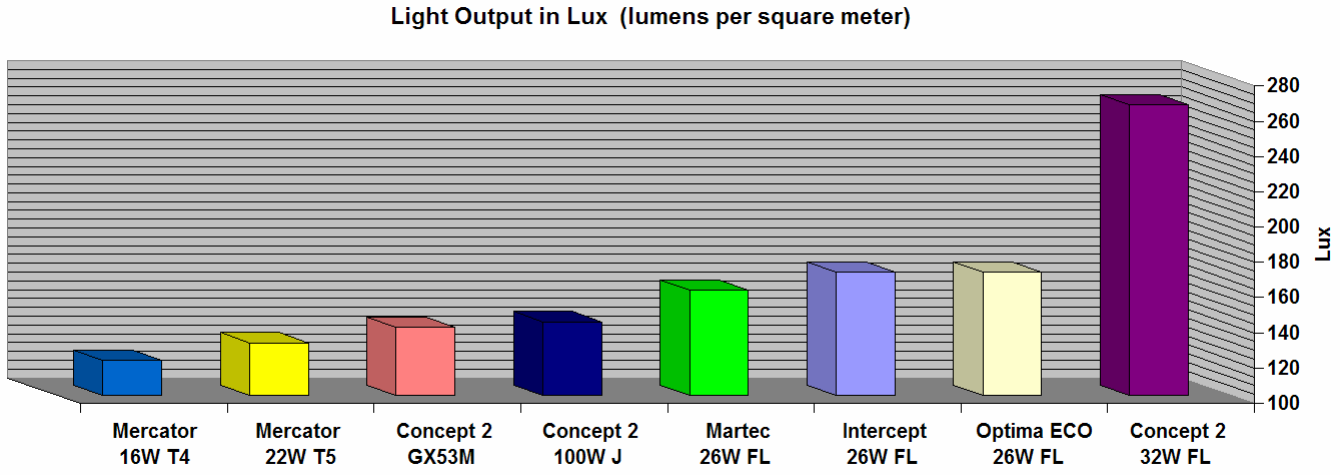
One of the biggest design challenges Hunter Pacific faces is to improve efficiency of our existing products and to develop new models that are even more efficient. Energy efficiency of the seven tested fans (for each speed) is shown in the test results table. To allow simple comparison we averaged the airflow and efficiency across all three speeds to produce the graphic on the following page. It can be seen the greatest airflow is generated by Concept 1 & 2, then followed by Intercept and Optima. All of these models are very similar in overall airflow performance.

The second worst performing fan, the Mercator Grange, is actually the most energy efficient, but with comparatively poor airflow on high and medium speeds it seems airflow performance of the Grange has been compromised to reduce its energy consumption. Philosophically, Hunter Pacific does not compromise the performance of its fans in a quest to claim efficiency, believing *ceiling fans that efficiently move an insufficient amount of air are counter productive.*




# Ceiling Fan Lighting Performance

Recently the Australian Government introduced restrictions on the importation of electric filament (incandescent) lamps to help combat climate change. Hunter Pacific used this opportunity to develop new, highly efficient fluorescent ballasts and tubes for its range of ceiling fan lighting accessories. The following graphic shows results of measuring light output from several currently available and soon to be released models and some competing products. Lux is a unit for measuring light falling on a surface; it may be thought of as measuring the usefulness of light given out by an entire light fitting.



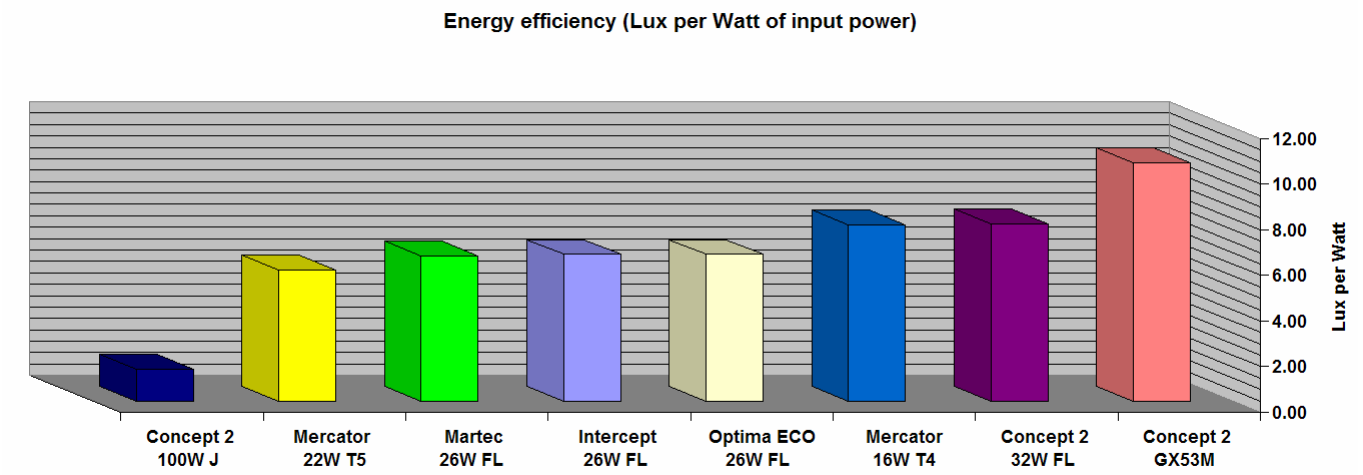

It can be seen that the new Hunter Pacific Concept 1 & 2 32W fluorescent lamp (in the flat-glass fitting) outperforms the lighting offered by those competing products by a significant margin. The next best performers are the Intercept and Optima ECO fans, both with 26W PLT tubes. The Concept 1 & 2 when fitted with GX53M (flat glass fitting), performs surprising well in this comparison test considering the input power is only 13.6W and the lux level is almost equivalent to a 100W J Type halogen tube.

The Mercator T4 (16W) and T5 (22W) perform rather poorly in both illumination level and efficiency when compared to the output from the 13.6W GX53M.

# Energy Efficiency of Lighting

Hunter Pacific has endeavoured to maximise the efficiency of its electronic ballasts plus improve the quality while lowering the environmental impact of our fluorescent tubes. Our ballasts and tubes comply with the Australian Governments Minimum Energy Performance Standards MEPS programs by achieving an Energy Efficiency Index (EEI) of A2.

As part of our lighting performance test program we analysed the energy efficiency of the same products tested above, and as expected the 100W halogen incandescent was the least efficient at 1.41 lux/watt while the GX53M excelled with 10.45 lux/watt. Results can be easily compared in the graphic below.




Most of the fluorescent lamp products had acceptable results for efficiency but the 13.6W GX53M considerably outperformed the 16W and 22W Martec products for both luminance and efficiency.

It is important for sales people to assist customers with purchasing lighting options that suit their needs rather than sell on 'wattage' alone. The rated wattage of a ballast or tube does not indicate brightness. 'Lux' takes into account the way the human eye responds to light intensity at different wavelengths, and is a measurement of the light output from the entire light fixture and not just the globe or tube (the brightness of which is measured in lumens). Colour temperature and CRI should also be carefully considered and the correct tube selected for the type of use (different tubes may be available as an option).

Always keep in mind the choice of materials and physical design are as important as the intensity of the light source when it comes to how well a light fitting performs.

# Summary

Hunter Pacific continually reviews and improves its products, striving to maintain dominance as market leader for quality of design, manufacture and performance. With engineering, testing and quality control facilities beyond any other ceiling fan company in Australia, Hunter Pacific takes pride that its products are better than other comparable brands.

"Buy the original and buy the best" is not just our slogan. Quality can be measured and test results prove our original products are indeed the best.

**Note:** The test results in this document were obtained during benchmarking trials from Feb 2009 to Aug 2009. Complete test records are kept on file for reference and we reserve the right to amend this document from time to time to reflect changes due to improved testing methods or changes in product performance. The full document with additional descriptions of the test methods can be downloaded from: www.hunterpacific.com.au/technical/benchmarks/Sept09_results.pdf

Competitor products, except for the Lucci Optima, were purchased through normal retail outlets. With the exception of the 32W FL light (which is a product under development) Hunter Pacific products were drawn at random from stock held in the Sydney warehouse.