Research on Full Spectrum Lighting

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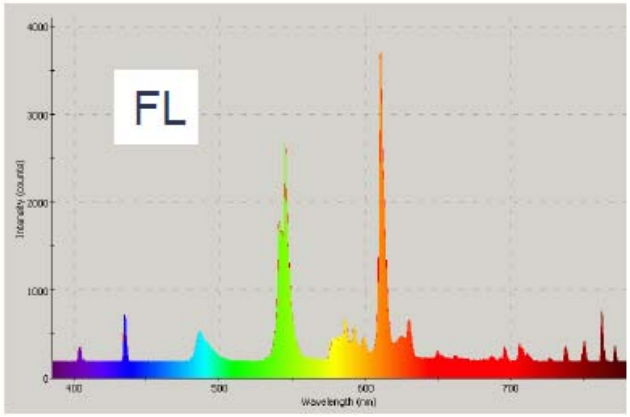
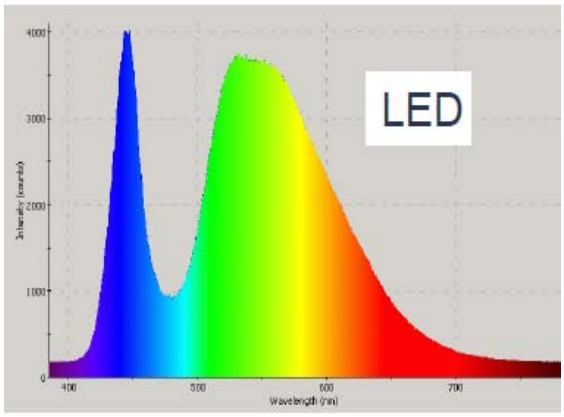
http://www.fullspectrumsolutions.com/whats_wrong_with_cool_white_lamps.shtml

THE FEDERAL GOVERNMENT OF GERMANY....has imposed a complete ban on the use of cool-white fluorescent tubes. This on the basis that their continued use was seen as harmful to the state of the nations health, particularly the workforce. Therefore today in Germany on a Federal level it is illegal to install the same cool-white fluorescent tubes we in Australia use as standard!



Cool White Fluorescent



Natural White LED tube

AMERICANS WITH DISABILITIES ACT: The Act recommends the exclusive use of full-spectrum lighting in the workplace. Employers are required to provide: Illumination as needed to prevent fatigue. Full-spectrum total room lighting. Glare control.

SOME LIGHT ON THE SUBJECT - RESEARCH: Citing American Optometrists Association figures, Dr. Sheedy noted that eye related complaints are the "number one" problem cited by computer users. Eye irritation nightmare:- Other problems becoming apparent include eye irritations produced by glare. Some experts warn that eyesight damage could become an OH&S nightmare in the 1990's. A related study found that more than 10% of workers complained of sore eyes every day. More than 50% suffered sore eyes at least once a week.(OHM issue No. 93)

Research during the last ten years shows that the physiological and psychological effects of artificial lighting are very significant and quantifiable. The amount of light is important, but the composition of quality of light is perhaps the most important factor, affecting health, temperament, and the ability to see clearly. Physiological studies have also conclusively shown that, under full spectrum lamps versus cool white lamps, humans have increased oxygen intake, reduced heart rate, increased ability to absorb vitamin D and calcium and improved muscle utilization. (Hughes,1986) (Neer,1984) Recent reports conclude, "The results support the conclusion that artificial lighting simulating natural light (full spectrum lamps) is perceived as significantly more pleasant, natural, bright and stimulating. Subjects felt more relaxed, less

fatigued and as having greater eye comfort under the simulated natural light Additionally, they rated their work as being more distinct, easier and satisfying. " (Hughes. 1986)

Initial experiments by Aston and Bell chambers were confirmed by the extensive research of the Naval Submarine Research laboratory. The experiments and research concludes that fluorescent lamps with superior color rendering result in a visual clarity that is 40% greater than typical cool white lamps.

In 1973, Dr. Ott used four windowless, first grade classrooms in Sarasota, Florida to test the effectiveness of full spectrum lighting. Two classrooms received installations of full-spectrum lights while two classrooms kept the standard cool-white fluorescent lights. The results: the level of behavior improved considerably in the classes with the full-spectrum lights while the overall academic level of the children in those classes rose considerably. The use of cool-white fluorescent lights has been legally banned in Germany at a Federal level, largely due to the work of Drs. Ott and Hollwich. Full-spectrum lighting provides many benefits that are of immediate relevance to our Occupational Health and Safety considerations. Human resource interests are being prioritized in progressive companies and business. These physiological and psychological advantages, combined with sustained quality performance, represent the future in work place illumination. 10/34 Marlborough Rd., Ph./Fax. (03)9876 0799

HEATHMONT 3135 Mob. 0418 334 127: Research during the last ten years shows that the physiological and psychological effects of artificial lighting are very significant and quantifiable. The amount of light is important but the composition, of quality of light, is perhaps the most important factor, affecting health, temperament, and the ability to see clearly. Sunlight is the most critical element of virtually all forms of life. The full spectrum lamps provided by United Energy are the closest approximation of sunlight available in fluorescent lamps. The studies and reports summarized here explain why it is so important to use natural sunlight type lighting wherever possible. All chemical, mineral and vitamin substances taken into the body have unique wavelength absorption characteristics. Wavelength energy penetrates the skin and interacts directly at the molecular level with chemicals and minerals in the blood supply, aiding in the substance breakdown for assimilation into the body of the desirable substances and excretion of the undesirable. Full spectrum lamps and sunlight produce wavelengths that kill numerous bacteria, molds, yeasts and viruses.

A most obvious example of this is that sunlight and full spectrum fluorescent light are used to treat jaundice. The short wavelengths of natural light interact with serum bilirubin, converting it to a nontoxic substance. (McDonagh, 1980)

A study by the Council of Educational Facility Planners compared cool white to full spectrum fluorescent lamps in a controlled scientific test in classrooms. Students had a 2.5 times better attendance record in rooms with full spectrum lamps. That is they were sick much less frequently. (Graves, 1985) (Hathaway, 1980)

Physiological studies have also conclusively shown that, under full spectrum lamps versus cool white lamps, humans have increased oxygen intake, reduced heart rate, increased ability to absorb vitamin D and calcium and improved muscle utilization. (Hughes, 1986) (Neer, 1984)

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Natural sunlight makes people feel better than artificial light does. The more natural the light the more comfort and better performance. Statistically significant differences are proven for subjects in rooms lit by cool white lamps versus full spectrum lamps. Subjects brought from outdoors into cool white rooms tended to become less lively or lethargic. The subjects exhibited no change when brought from outdoors into full spectrum rooms. Visual accuracy and alertness were measurably better in the full spectrum rooms versus the cool white rooms. (Maas, 1974)

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Being able to see clearly is typically attributed to the amount of light, however, clear color rendering is at least as important. The most obvious example of this is white appearing as white and black as black, instead of light yellow and dark brown. Enhanced black and white contrast makes written material easier to read and makes objects appear brighter.

Initial experiments by Aston and Bellchambers were confirmed by extensive research by the Naval Submarine Research Laboratory. The experiments and research concludes that fluorescent lamps with superior color rendering result in a visual clarity that is 40% greater than light from typical cool white lamps. The reason for this is that the red/green contrasts contribute to distinguish borders and the blue/yellow make little or no contribution to the distinctness of borders. Cool white lamps are strong in the blue/yellow contrasts and weak in the red/green. Full spectrum lamps have an appropriate balance of spectral contrast. (Worthy, 1985)

Go Green Solutions 4' LED replacement tubes for fluorescents are available in Warm White (3,000 K), Natural White (4,000 K) and Daylight (5,000 K). They often use 50% less energy than fluorescents and provide full spectrum light, no high frequency flicker or hum and much longer life span.

FOR MORE INFORMATION

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