

Friday, 10th October 2008

RESPONSE TO CELMA STATEMENT DATED JUNE 2007 CONCERNING T5 ADAPTORS

In late 2006, European Save It Easy® partner companies indicated that the Federation of National Manufacturers Associations for Luminaires and Electrotechnical Components for Luminaires in the European Union (CELMA) was preparing to publish a statement on T5 adaptors in T8 luminaires. Since 1998 Save It Easy®, the only in-line T5 adaptor patented in 50 countries with minimum performance guarantees and 2 year product warranty had been gaining increasing acceptance in the European retrofit market as a reliable and cost effective way to upgrade to T5 technology.

We viewed the release of CELMA's document as timely given other forms of T5 adaptors known as the "fitting-within-fitting" type had entered the European market and there were some legitimate safety and quality concerns with a small number of them. The CELMA statement was seen as an opportunity for the European luminaire and ballast industry to respond to the T5 adaptor retrofit market and we looked forward to it.

CELMA released the statement in May 2007 and it was a disappointment. The generalisations and conclusions drawn from the questions put forward were at best simplistic or inept and at worst, a lost opportunity to improve overall T5 retrofit product standards. Through generalisation and inference, CELMA's document appeared to question the legitimacy of all T5 adaptors – irrespective of their testing and field performance history.

In an age where more and more consumers are concerned about energy usage and harmful greenhouse gas emissions, it seems to us that CELMA should be looking to promote such solutions rather than taking a negative and arguably protectionist approach.

Put simply, Save It Easy® enables energy efficient T5 electronic lamps to be fitted into existing T8/T12 electromagnetically ballasted fittings. There is no need to modify the existing luminaire – in fact we **guarantee** that Save It Easy® will **reduce the energy** consumed by fluorescent lighting **by at least 25%**, meaning a significant saving in electricity charges to you and a positive impact on the environment.

In Australia and New Zealand our performance guarantee is backed by product liability insurance to the value of ten million dollars, by field trials presented as on-going case studies of Australian installations since 2006 and by customers who not only speak to others about their experiences with Save It Easy® but continue to invest in Save It Easy® to achieve the lighting energy cost reductions they seek.

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Any reasonable examination of the **independent testing** completed, the **case studies** available, the **photo gallery of installations** and **happy customers** willing to provide **product testimonials**, and the **impressive record of performance** time after time that Save It Easy® delivers, demonstrates a product that is **un-like any other T5 adaptor** on the market today.

Save It Easy® has now grown to be **the most popular retrofit T5 adaptor** in Australia and is fast becoming the adaptor of choice in New Zealand.

Attached you find our detailed response to the CELMA document.

We will continue to lobby industry organisations such as CELMA to demonstrate leadership in what we firmly believe is an important market segment that is attractive to customers, delivers key energy savings and reduces harmful greenhouse gases, at good rates of return for investment.

Should you wish to discuss any aspect of our response, please contact me on 0210 298 7213 or indeed by email at joe.trimboli@ecobright.co.nz.

We look forward to continuing to assist your organisation in strengthening its green credentials.

Yours sincerely

Joseph D. Trimboli
General Manager, Asia-Pacific
ecoBright® energy solutions Limited

Attachment: Detailed response to CELMA document (6 pages)

RESPONSE TO CELMA DOCUMENT ON T5 ADAPTORS DATED JUNE 2007



CELMA

C.E.L.M.A.

*Federation of National Manufacturers
Associations for Luminaires and
Electrotechnical Components for
Luminaires in the European Union*

CELMA STATEMENT

Do T5 Adaptors for T8 Luminaires ensure energy saving and conformance with relevant standards?

June 2007

Energy savings as well as the responsible use of our natural resources is of major interest to the lighting technologist. Recent innovations in the lighting industry and, as a consequence also of the many European Directives, energy savings have increased dramatically and will subsequently contribute to safeguard the living conditions of future generations. (The LVD, EMCD, WEEE, RoHS Directive, EPBD, Ballast Directive, EuP Directive and CELMA EEI are terms and regulations used by those who are involved in the design of modern luminaire installations respecting all safety standards)*. *see below

Fluorescent lamps with a tube diameter of 16 mm (T5 fluorescent lamps) and the luminaires especially developed for these lamps are an example of innovative lighting. The use of T5 lamps requires electronic ballasts. The "high efficiency versions" can reach a lamp luminous efficiency of more than 100 lm/W. The tube length of T5 fluorescent lamps is 50 mm shorter than the T8 lamps tube length and shows optimised luminous flux-temperature behaviour. Sophisticated engineered luminaires for T5 fluorescent lamps enable the realisation of extra economic and innovative lighting systems.

It would appear quite simple and economically viable to replace T8 lamps in luminaires with magnetic ballasts by a T5 lamp adaptor and, hence, do a "quick step" into modern lighting technology.

It is, however, questionable if this "quick step" is ecologically and economically wise.

T5 lamp adapters are offered in different versions. In principle the adapter consists of a length of compensating elements with G5 sockets and G13 plinths (caps) and integrated electronic ballast. Depending on the system, the starter unit will be dismantled or replaced by a "box". The conventional magnetic ballast is then used as a filter unit. The commonly used compensation capacitors (parallel or serial circuit) must be removed in any case requiring the services of a skilled person. The remaining capacitors may cause over-voltage or increased electrical currents (resonances), which may result in the destruction of the adapters and other luminaire parts.

ECOBRIGHT RESPONSE:

Ecological wisdom:

- *upgrading to T5 lamps reduces the content of mercury in lamps by up to 30%,*
- *mercury is known as an "accumulating substance" and is hazardous to biological organisms—minimising its use is vital to reduce its effect on the environment;*
- *T5 lamp upgrades using Save It Easy® significantly reduces the amount of waste going to landfill when compared to traditional upgrades where the luminaire is completely removed and dumped.*

Economical wisdom:

- *Cost of upgrade using Save It Easy® retail cost compares quite favourably (an up to a 70% cheaper outcome) to cost of traditional upgrade where fittings are removed and dumped, replaced with new fittings and lamps, ceiling grid adjusted, mess and disruption caused and an electrician is required.*
- *Payback on investment using Save It Easy® is typically around 24 months.*

Capacitors:

- *ecoBright® does not insist on the removal of capacitors when installing Save It Easy® as the current increase mentioned by CELMA is compensated by a change in power factor resulting in an overall wattage (power) reduction.*

Special items with regard to the use of T5 lamp adapters

A) Responsibility of the luminaire manufacturers – legal consequences

T8 luminaires are designed with regard to safety and lighting technology for the use of T8 lamps not T5 lamps.

The product liability and the assured quality are only valid for luminaires, which are released by the manufacturer for the respective lamps. The manufacturer's data thereto is printed on the label of the luminaires and/or may be found in the manufacturer's catalogues or documentation.

CE marking and the safety engineering certification of the luminaire by independent certification institutes (e.g. ENEC) is based on the use of lamps as named by the luminaire manufacturer and as marked on the luminaire.

When a user of a lighting installation manipulates the system by, for example, installation of an adapter, the responsibility is transferred from the luminaire manufacturer to the customer. Safety certificates from neutral certification institutes as well as CE-marking are no longer valid.

Due to the subsequent manipulation of the luminaire the responsibility of the manufacturer expires. All documented performance features of the luminaire, the basic safety requirements as well as verified EMC compatibility criteria lose their validity. Many luminaire manufacturers include this evidence in their manuals in relation to the product as designed not to the product modified by unauthorised application of an adapter.

Following one example of such a declaration:

"Any manipulation of our products and their packaging like changing, revamping (modification), marking is illegal and infringes our registered trademarks. Such modifications may influence the technical properties of our products, may even destroy the product and possibly cause subsequent damage to other objects, which cannot be attributed to the "manufacturers' name".

ECOBRIGHT RESPONSE:

Safety & Fit for Purpose:

- *Manufacturers liability for luminaires is typically limited to 12 months and invalidated when customers use lamps other than the brand specified by the OEM - this ensures future lamp sales for the OEM, additionally retro-fit projects typically occur on equipment that is well over its warranty period and where OEM's either no longer exist or have discharged their obligations due to the passage of time.*
- *CELMA's statements on "luminaire manipulation" imply the luminaire must be dismantled and in some way changed when any T5 adaptor is used. As we state this is not the case when T5 lamps are installed with the Save It Easy® solution—our comments here are not generic and only apply to Save It Easy®. The fitting process is a simple one minute retrofit similar to changing a lamp and replacing a starter. It is recognised that an electrician is not required to change a fluorescent lamp - in the same sense therefore Save It Easy® does not require an electrician to install it and as such is known as a "plug and save" device, see installation pictures below.*
- *In Australia and New Zealand, there is no obligation to renew CE markings on luminaires which in any case are normally concealed within gear trays. Since no original equipment is removed the CE markings and safety validity of the original equipment are not compromised.*

Save It Easy®

The ultimate Plug & Save e-Ballast



B) Technological conditions for the use of T5 lam adapters

B1) Lighting characteristics:

The original characteristics of a luminaire is predetermined by the luminaire manufacturer and is fundamentally changed due to the mounting of the T5 lamp adapters in a way that the calculated lighting performance of the application is no longer applicable. The optical elements are optimized for T8 fluorescent lamps. The use of T5 lamp adapters may change the position and form of the light source in respect to the allocation of the optical luminaire elements, which result in a change of the luminosity distribution. In any case, an inspection of the adherence of the default lighting characteristics (e.g. distribution of the luminosity and the limitation of glare at workplaces) is necessary to respect the demands of health and industrial safety. The change in the operation of the lamps may result in a decreased lifetime of the lamp.

In most cases T5 lamp adapters for high efficiency lamps replace T8 fluorescent lamps. The power and the related luminous flux of the lamps used are reduced considerably. This is a point of discussion, since economic energy consumption is promoted, and, hence, the amount of light required is neglected and remains far behind the planned requests.

The facts of comparing measurements are displayed in the following chart.

Systems (lamp, ballast, nominal luminous flux)	System power	System current	Measured luminous flux	Relative luminous flux
58W/840 T8 lamp with low loss ballast 58W (5200 lm)	64,7 W (100 %)	612mA	4792 lm	100 %
35W/840 T5 lamp with Electronic Ballasts (3300 lm)	38,2 W (59 %)	176 mA	3354 lm	70 %
35W/840 T5 lamp with lo loss ballast 58W, T5 lamp adapter (3300 lm)	32,5 W (50,2 %)	154 mA	2986 lm	62,3 %

The luminous flux of the 35W/T5 fluorescent lamp operated with low loss ballast and T5 adapter are reduced by 37,7 % in comparison to the T8 lamp version with low loss ballast. The result is a reduction in illumination. The illumination and the quality of light with regard to EN 12464-1 of the original planning cannot be maintained. Additionally, an inspection by authorities for the protection of employees would be an essential requirement.

The economic view has to be put into perspective because an additional system would be required besides the T5 adapter in order to reach the original specified and design illumination.

ECOBRIGHT RESPONSE:

Lighting Characteristics:

- Without additional information ecoBright® is unable to question the results quoted by CELMA above,
- The testing however raises more questions than it answers in that:
 - The T5 adaptor tested is not specified - consequently all T5 adaptors are tainted by implication
 - How were the tests performed?
 - Who performed them - is a certificate of testing available to view?
- T5 lamps retro fitted with Save It Easy® have been rigorously tested by a NATA registered laboratory "Light Labs" in Sydney Australia (report is available at: www.ecobright.com.au/prods/sie/tech/natarep.pdf) and shown not to significantly alter the polar curve or light dispersion pattern of the luminaire when it is compared to a T8 lamp installed in the same luminaire, strong evidence that demonstrates through its patented design, superior ability to position the lamp centrally within the confines of the luminaire. It is recognised that CELMA's comments above could indeed apply to the fitting-within-fitting type T5 adaptors.
- It is also clear that the system being compared is that of a T8 58W lamp versus the T5 equivalent 35W lamp - where it is recognised that a difference of initial lumen output exists. It should be added that the lumen depreciation rate of a T8 lamp is 30% over life, whilst a T5 experiences a 10% depreciation over its life. The 58W T8 lamp lumen output will reduce to a far greater level over its life than the T5 does. What should be asked instead is whether the T5 upgrade meets current customer requirements and not whether the initial design parameters which may be irrelevant to the customers present needs, should continue to be met.

B2) Safety features, quality and thermal load

A T5 lamp adapter may adversely influence the temperature within the luminaire. A possible over-temperature may occur in the adapter itself or in other parts of the luminaire. Creepage distances and clearances as well as the mechanical strains on the sockets, due to the greater weight of the T5 lamp adapter, need to be considered.

The lifetime of T5 lamp adapters is not congruent to the demands of the market in many cases.

T5 lamp adapters are, in principle, electronic ballasts, which are operated under aggravated circumstances. Luminaires are certified with the use of electronic ballasts in relation to the existing temperature (to being one such measurement point) for a suitable lifetime of the ballast. The luminaire, as originally designed, is tested also to prove suitability under abnormal conditions of use. This condition is not proven for the adapter kits during installation. A statement of the temperature load (life time expectation and safety) is not given. Error status and its impact on other components of the luminaire, especially for the magnetic ballast (e.g. warming up due to rectifier effects) is not examined.

B3) Economic efficiency – energy efficiency

Luminaires for T8 fluorescent lamps with T5 lamp adapters can never reach the economic efficiency of luminaires with electronic ballasts, which are engineered and optimized for the use of T5 lamps. An optimisation of the system (determination and choice of the high guiding and optical elements, the temperature control, choice and arrangement of the components of the luminaire) cannot be regarded for the adapter kits. The total energy consumption of lamp and ballast referring to EN 50294 and the classification scheme of CELMA for fluorescent lamp circuits require, for the compensation of measurement data, a minimum ballast-lumen-factor. The standard stipulates a ballast-lumen-factor between 0,925 and 1,075. The tested T5 lamp adapters in the chart shown above do not reach these values.

B4) Electromagnetic compatibility (EMC)

Many samples of T5-adapters have been found to not respect the limits of electromagnetic compatibility specified in EN 55015 and required by the EMC Directive nor the new CDN-measurement method for the frequency range from 30 MHz to 300 MHz. Compliance with the EMC Directive may only be proven with the adaptor installed in the luminaire within which it is intended to be used.

The following common statement of the "Bundesnetzagentur" and the DKE-working group "EMC of lighting systems" supported by CELMA, provides a clear briefing.

ECOBRIGHT RESPONSE:

Safety:

- *The thermal characteristics of the original luminaire are not adversely affected through the use of Save It Easy® - indeed it can be demonstrated that temperatures within T8 luminaires where this type of retrofitting work is considered suitable for, already generate temperatures that adversely affect T8 lamp lumen output. OEM lamp manufacturers have data that shows that T8 lamps will decrease in lumen output when temperatures exceed 25°C.*
- *The difference in weight between a T5 lamp fitted with Save It Easy® and a T8 lamp is negligible and well within the tolerance limits of the luminaire.*

Energy efficiency:

- *Whilst the CELMA classification does not apply in Australia and New Zealand, it is necessary to be sure that any original energy efficiency testing is done in a representative luminaire and not a "bench test". The NATA testing completed by "Light Labs" measured the energy efficiency of a retrofitted Save It Easy® T5 lamp to within 4% of a conventional new T5 luminaire. Given the price difference customers must make a judgment on whether the cost of a new luminaire is worth the investment given an expected improvement in energy efficiency of only 4%.*

EMC Compliance:

- *Save It Easy® is fully EMC compliant in both Australia and New Zealand.*

**Joint statement by Working Group 767.11.15
"EMC of lighting equipment"
and the
Federal Network Agency, section 413,
on the
EMC assessment of T5 adapters**

In EMC assessments, only the components specified by the manufacturer are considered in assessing the interference behaviour of luminaires. Retro-fitted electronic ballasts also require assessment.

T5 adapters to be fitted into luminaires designed for T8 lamps with magnetic ballasts are considered electronic ballasts from the electromagnetic compatibility point of view. Hence they have to be treated as electronic ballasts, requiring proof to be furnished of the modified luminaires' compliance with permitted interference levels, especially with regard to emissions. The interference voltage and the magnetic and electric interfering field strength are measured after the luminaire has been modified.

Manufacturers are required to provide proof of safety for T5 adapters intended for retro-fitting to luminaires with T8 lamps and magnetic ballasts. Such proof should include a list (favourable status list) of all luminaires to which T5 adapters can be fitted without causing them to exceed the limits for interference levels.

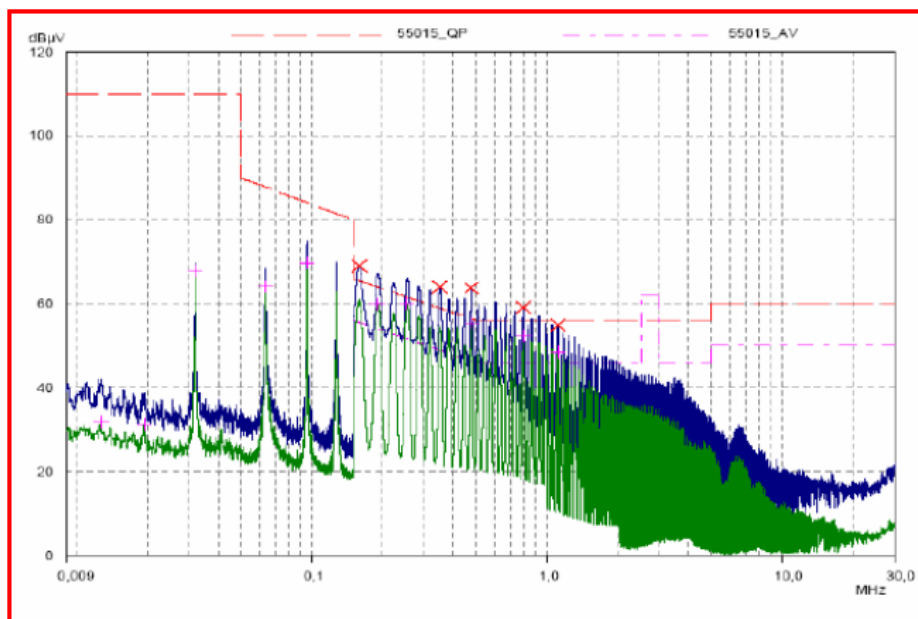
Where such a list is not provided, the assessment will be performed using off-the-shelf luminaires.

Proposals for standardisation in this matter are being prepared by IEC.

BERLIN, FEBRUARY 2006

For the Federal Network Agency, section 413 For DKE Working Group 767.11.15

The following figure displays a measurement of the radio interference voltage referring to EN 55015 of a common luminaire for T8-fluorescent lamp with low loss ballasts and T5 lamp adapter kit installed with a 35W T5 lamp. The values are up to 9 dB μ V higher than the allowed limits. This luminaire is not permitted in the European Community due to possible interference with radio communication, digital TV, police- and fire department radio frequencies, etc.



C) Environmental aspects

The recycling obligation of the luminaire manufacturer is restricted to the originally lamp delivered. Subsequent mounted components are not within this responsibility – respective agreements have to be set up with the T5 lamp adapter manufacturer.

The T5-adapter has to be in compliance with the European "Restriction of Hazardous Substances Directive" (RoHS Directive).

D) Conclusion

The presented aspects demonstrate that the mentioned "quick step = development jump" from T8-luminaire to modern T5-luminaire with T5-adapter is not so easy to realize. Users of luminaire installations should not use the slogan "Economics before safety" since the total bill may be presented later on!

The use of T5-adapters is connected with numerous risks:

- Take over of product risk (responsibility) due to conversion
- The base of the initial CE conformity is omitted
- Certifications of independent certification institutes lose their validity
- Shifting of the guaranteed lighting characteristics
- Enormous reduction of the illumination, undershoot of the requested ballast-lumen factor (standards and directive for working places)
- No temperature assessment within the luminaire (lifetime and safety)
- Possibly no appraisal of the adapter in the luminaire in respect to error recovery of the adapter and abnormal operation mode of the lamps
- Quality and thermal load within the luminaires
- Possibly no certificate of EMC
- Recycling duty missing

ECOBRIGHT RESPONSE:

Environmental Aspects:

- *This is disingenuous. Since the luminaire is not modified in any way the recycling requirements are not changed. Also, since the recycling costs are likely to be met at point of purchase of a luminaire (i.e. the replacement luminaire) the recycling obligation is being met by the client anyway.*
- *Should similar provisions be introduced in Australia and New Zealand, ecoBright® will ensure customers are fully aware of their obligations.*

Conclusion:

- *This is a totally unjustified set of statements that have no basis in fact. The 'aspects' presented do not 'demonstrate' anything at all – they are a series of questions to which no answers are given and from which therefore, NO CONCLUSION can be drawn.*
- *The correct assessment is that, if the product is warranted to meet the appropriate compliance criteria (as ours is), and if it is backed up by an industry leading warranty together with substantial practical experience of installation in a variety of situations (as ours is) then it is a very cost effective way of achieving significant energy savings.*
- *Save It Easy® is not a universal panacea nor will it make the luminaire perform better - any retrofit will take on the existing properties. There are therefore times when the installation of new luminaires is more appropriate e.g. reflective properties are poor, connections in the lamp holders are worn, etc. If the luminaire needs to be replaced it should be – but Save It Easy® is certainly a viable way of achieving significant cost savings and reduction in harmful greenhouse gas emissions.*
- *Given the real urgency that the issue of Global Warming creates, together with the significant financial burden increased energy costs are imposing on customers, we would have expected CELMA to have adopted a more measured and responsible approach.*
- *This document simply poses a number of hypothetical questions, makes no attempt to answer them and then draws a conclusion that could not possibly be arrived at without having the specific answers. Also, in attempting to present every retrofit product as being the same it is at best disingenuous and at worst deliberately misleading.*