

PROGRESSIVE SYNERGY

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The introduction of T5 (16mm diameter) fluorescent tubes was a fundamental rethink, producing a new specification that did not include the ability to retro-fit into existing fluorescent luminaires. It did recognise the ability of electronic ballasts to start and run fluorescent tubes at higher voltages than previously possible with magnetic ballasts and glow starters.

Fluorescent tubes operated at high frequency are more efficient, and T5 lamps are among the most efficient high quality white light sources available for general lighting. From the outset it was decided that T5 lamps should be run by electronic ballasts only.



High frequency operation, not only improves efficiency, it eliminates the 100Hz flicker associated with conventional magnetic ballasts. This means with better visual comfort as research has revealed that a significant proportion of people suffer some level of distress with 100 Hz. This is usually expressed as eye strain or headaches and can increase the absenteeism.

A less obvious benefit, particularly in urban situations, is the quiet running of electronic ballasts. However for library reading rooms, music rehearsal rooms and churches it is noticeable.

Any discharge lamp is only as good as the control gear operating it and so GE Lighting has now taken the second step in T5 technology. It has introduced a new range of electronic ballasts with advanced features specifically matched to their Starcoat™ T5 linear fluorescent lamps.



The range includes multiwattage ballasts for both High Efficiency and High Output Starcoat™ lamps so that only 12 ballasts provide 20 different lamp options. There is a built-in microprocessor that automatically recognises the lamps connected. Microprocessor applies to 2 models only marked with * (BLS/E/1x14-24-35-49W/T5 and BLS/E/1x21-28-39-54W/T5) Table 1 shows the different lamp options available from twelve ballasts. This simplifies stocking and inventory for luminaire

Ballast	Lamps	High Efficiency Starcoat				T5 High Output Starcoat T5				
		14W	21W	28W	35W	24W	39W	49W	54W	80W
BLS/E1x14-21-28-35W/T5		1	1	1	1					
BLS/E1x14-24-35-49W/T5*		1			1	1		1		
BLS/E1x21-28-39-54W/T5*			1	1		1		1		
BLS/E1x80W/T5										1
BLS/E2x14-21-28-35W/T5		2	2	2	2					
BLS/E2x24W/T5						2				
BLS/E2x39W/T5							2			
BLS/E2x49W/T5								2		
BLS/E2x54W/T5									2	
BLS/E2x80W/T5										2
BLS/E3x24W/T5						3				
BLS/E3-4x14W/T5		3-4								

Table 1: Gear and lamp options

manufacturers in terms of the components needed. It also expands the range of lamp options available to their customers.

T5 lamps have been designed to operate at a higher ambient temperature. This means luminaire designers can consider smaller enclosures. Fluorescent lighting can create a dominant pattern on the ceiling and diminishing the size of each luminaire can produce a marked improvement to the appearance of the installation. For recessed luminaires it releases space in the ceiling void for other services. The GE ballasts are only 21.5 mm high so give designers an excellent opportunity to take full advantage of the T5 cross-section and minimise the depth of their products.

The ballasts are suitable for a wide supply voltage of 198-254 V and 50/60 Hz, provide controlled preheating to ensure long lamp life, and minimise end blackening. This starting mode makes lamp life virtually unrelated to the frequency of on-off switching. Lamp life will soon become more significant as full implementation of the Waste Electrical and Electronic Equipment (WEEE) Directive is required by August 2005. Reprocessing of lamps, rather than disposal to landfill sites is going to add cost, be it directly or indirectly. Maximising lamp life will thus have an increased financial benefit to end users and producers.

As lighting controls become more widely used as an energy conserving measure, so the frequency of switching will increase. The fundamental rationale of lighting controls is to switch off lighting when it not needed. With conventional magnetic and electronic circuits there is a relationship between lamp life and

switching cycle. Table 2 shows how lamp life decreases as switching frequency increases.

Switching cycle	50Hz lagging magnetic circuit (hours)	HF Electronic circuit with warm start (hours)
12 hours	15,000	17,000
3 hours	12,000	15,000
1 hour	9,000	12,000

Table 2 Typical group life survival upto 10% failures

Using ballasts and lamps supplied by the same company has clear commercial benefits. There is no divided liability and GE Lighting is offering a five year guarantee for their ballasts when used with GE Starcoat™ lamps.

In summary using T5 fluorescent tubes together with the latest dedicated electronic ballasts means:-

- Most efficient white light
- Simplified inventory of components for OEM and maintenance
- Shallow ballasts to minimise luminaire depth
- No flicker
- Quick or rapid start and restrike
- Quiet operation
- Maximised lamp life minimising disposal/reprocessing costs
- Supplier guarantee

For the majority of new industrial and commercial interior lighting schemes T5 fluorescent lighting should be the number one consideration.

