EXPOSURE ASSESSMENT OF THE ELECTRIC AND MAGNETIC FIELDS OF ENERGY SAVING BULBS

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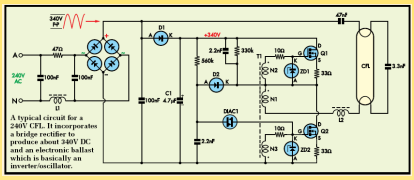
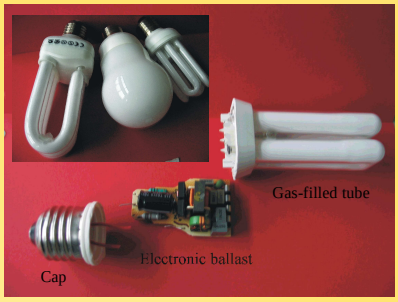
INTRODUCTION

Energy saving bulbs (ESB) are recommended in national energy saving programs. However, recently it was suggested that the bulbs generate EMF's which are hazardous for exposed individuals (Criirem, 2007).



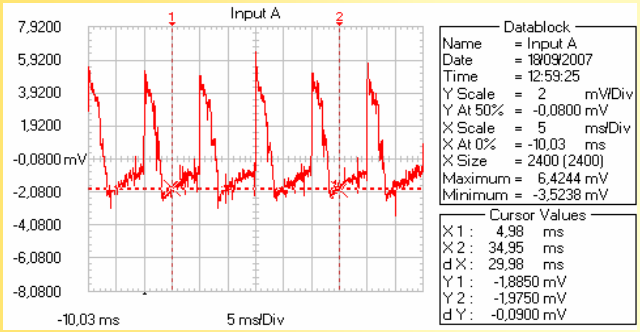


METHOD

In order to verify these allegations we measured the waveform, the harmonic content, the electric and magnetic field of 8 different types of energy saving bulbs at different distances using a halogen and an incandescent lamp as control lamps. The measurements were performed by means of the most adequate measurement equipment.

RESULTS

The next two figures show the waveform and the harmonic content of a 11 W ESB.



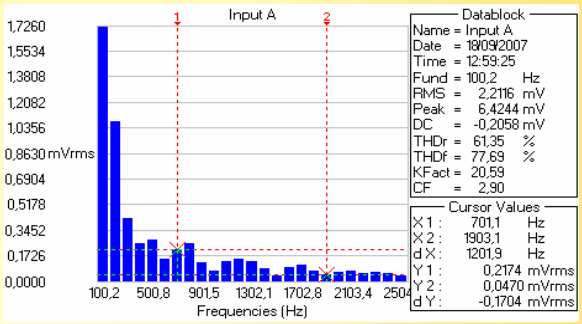


Table 1: E-field and result of the summation formula for the harmonics of the ESBs and control lamps at different frequencies

	Energy saving bulbs (CFLi)							Control lamps	
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
f(Hz)	50	50	50	50	50	50	50	50	50
E(V/m)	1322	1475	1079	1435	1895	815	1640	290	318
f(Hz)	100	100	100	100	100	100	100	100	100
E(V/m)	129	172	102	91	631	346	16	13	27
f(Hz)	150	150	150	150	200	200	150	150	150
E(V/m)	63	116	23	82	12	51	42	2	10
f(Hz)	27000	30000	26000	43000	42000	$\sum_{i=1}^{1MHz} \frac{E_i}{E_{L,i}} + \sum_{i>1MHz}^{10MHz} \frac{Ei}{a} \leq 1$			
E(V/m)	396	440	382	288	410				
f(Hz)	85000	90000	80000	87000	83000				
E(V/m)	21	20	16	15	12				
Σ	**0.42**	**0.49**	**0.33**	**0.42**	**0.68**	**0.33**	**0.36**	**0.06**	**0.08**

CONCLUSION

The results of the summation formula (Σ) in the table show that the E-field of every energy saving bulb is in every case smaller than 1. Hence the field strength is in compliance with the ICNIRP (1998) reference level for multiple frequencies.