



37-

Just the Facts ...

Low Mercury Fluorescent Lamps

February 2003

1. Background: In 1994, the National Electrical Manufacturers Association (NEMA) estimated that the United States annually disposes of 500 to 550 million fluorescent lamps. More than 80 percent of those fluorescent lamps belonged to industrial and commercial facilities. The presence of mercury (Hg) in a fluorescent lamp is essential for the function of the lamp. The fluorescent lamp industry has agreed upon the importance of reducing the amount of Hg found in fluorescent lamps. NEMA has provided statistics that show the average Hg content for a 4-foot, 40-watt T-12 (for twelve-eighths of an inch) lamp has been reduced from 48.2 milligrams to 22.8 milligrams of Hg.

2. New Technology: The establishment of the Toxic Characteristic Leaching Procedure (TCLP) standard of 0.2 mg/l for mercury by the Environmental Protection Agency (EPA) made fluorescent lamps a hazardous waste. In 1995, Philips Lighting Company introduced its new “Alto” technology for low mercury fluorescent lamps. The purpose of this technology was to reduce the amount of Hg in the lamps to a level where it would pass the Toxic Characteristic Leaching Procedure (TCLP) standard of 0.2 mg/l. Other companies such as General Electric (GE) and Osram Sylvania have followed Philips and developed their own low mercury fluorescent lamps that pass TCLP testing (see paragraph 4). The U.S. Army Center for Health Promotion and Preventive Medicine recommends the use of low mercury fluorescent lamps. Currently, to distinguish low mercury fluorescent lamps from normal fluorescent lamps, the three American manufacturers are using some type of green markings for identification. Philips Lighting “Alto” lamps have green end caps. Osram Sylvania “Ecologic” and GE “Ecolux” are using green lettering for identification. Foreign manufacturers may be using green markings on fluorescent lamps; however, the markings may not indicate low mercury.

3. Energy-Savings and Life: Currently, the Defense Logistics Agency (DLA) has an Energy Efficient Lighting catalogue where both Energy-Saving fluorescent lamps and low mercury fluorescent lamps can be obtained. When comparing Energy-Saving fluorescent lamps to low mercury fluorescent lamps in wattage and average life, both are comparable with each other with wattage at 32-34 watts and an average life of 15,000-20,000 hours for the 48-inch lamps. However, only the low mercury fluorescent

lamps will pass the TCLP test. “Energy-saving” is not synonymous with “low mercury”. If your activity has purchased energy-saving fluorescent lamps believing they were also low mercury, inspect the lamps to ensure they are in fact low mercury lamps. You can contact DLA for more information at 1-800-DLA-BULB or visit to their web site at <http://www.dscp.dla.mil/gi/general/light1.htm>.

4. TCLP Test Results: The TCLP test results obtained from Philips, Sylvania, and GE show these lamps are below the regulatory limit of 0.2 mg/L. The last three tables show test results from sampling performed by USACHPPM of the Philips Alto lamps, GE Ecolux lamps, and Sylvania Ecologic lamps.

Philips “Alto” T8 Medium Bi-Pin

Kelvin Temp	*CRI	Length (inches)	Nominal Watts	Avg. Life	Part Number	NSN	Manuf TCLP Results [units (mg/L) at chemical (Hg)]
3000	75	48	32	20,000	F32T8/TL730/ALTO	6240-01-447-2666	0.06 (avg of 3 tests)
3500	75			20,000	F32T8/TL735/ALTO	6240-01-447-3464	
4100	75			20,000	F32T8/TL741/ALTO	6240-01-447-3469	
3000	85			20,000	F32T8/TL830/ALTO	6240-01-447-3473	
3500	85			20,000	F32T8/TL835/ALTO	6240-01-447-3480	
4100	85			20,000	F32T8/TL841/ALTO	6240-01-447-3482	
5000	86			20,000	F32T8/TL850/ALTO	6240-01-425-8301	
5000	75			20,000	F32T8TL750/ALTO		

Philips “Alto” T12 Medium Bi-Pin

Kelvin Temp	*CRI	Length (inches)	Nominal Watts	Avg. Life	Part Number	NSN	Manuf TCLP Results [units (mg/L) at chemical (Hg)]
4100	62	24	20	9000	F 2 0 T 1 2 C W / R S / E W / A L T O	6240-01-453-6482	0.10 (avg of 8 test)
4100	62	48	34	20,000	F40T12CW/R S/EW/A LTO	6240-01-424-9648	
3000	70	48	40	20,000	F40T12/SPEC30/RS/EW/ALTO	6240-01-431-3093	0.12 (avg of 4 tests)
3500	73			20,000	F40T12/SPEC35/RS/EW/ALTO	6240-01-431-3257	
4100	70			20,000	F40T12/SPEC41/RS/EW/ALTO	6240-01-431-3268	
3000	85			20,000	F40T12Ultralume/30U/RS/EW/ALTO	6240-01-431-3314	
3500	85			20,000	F40T12Ultralume/35U/RS/EW/ALTO	6240-01-431-3331	
4100	85			20,000	F40T12Ultralume/41U/RS/EW/ALTO	6240-01-431-3359	
5000	85			20,000	F40T12Ultralume/50U/RS/EW/ALTO	6240-01-431-3363	

Kelvin Temp	*CRI	Length (inches)	Nominal Watts	Avg. Life	Part Number	NSN	Manuf TCLP Results [units (mg/L) at chemical (Hg)]
4100	62	96	60	12,000	F96T12/CW/EW/ALTO	6240-01-453-6482	0.10 (avg of 8 tests)
3000	53	24	20	9,000	F20T12/WW/ALTO		
4100	62	36	30	18,000	F30T12CW/RS/ALTO		
4100	62	36	25	18,000	F30T12/C W/RS/E W/ALTO		
3000	70	48	40	20,000	F40/SPEC30/ALTO		0.12 (avg of 4 tests)
3500	73	48	40	20,000	F40/SPEC35/ALTO		
4100	70	48	40	20,000	F40SPEC41/ALTO		
3000	85	48	40	20,000	F40/30U/ALTO		
3500	85	48	40	20,000	F40/35U/ALTO		
4100	85	48	40	20,000	F40/41U/ALTO		
5000	85	48	40	20,000	F40/50U/ALTO		0.10 (avg of 8 tests)
3000	53	48	34	20,000	F40T12WW/R S/EW/A		
4100	51	48	34	20,000	F40T12LW/RS/EW/ALTO		
6500	84	48	34	20,000	F40T12DX/R S/EW/A LTO		

Philips “Alto” T12 Single Pin

Kelvin Temp	*CRI	Length (inches)	Nominal Watts	Avg. Life	Part Number	NSN	Manuf TCLP Results [units (mg/L) at chemical (Hg)]
4100	62	96	60	12,000	F96T12/CW/EW/ALTO	6240-01-453-7614	0.10 (avg of 8 tests)

Osram Sylvania “ECOLOGIC”

Kelvin Temp	*CRI	Length (inches)	Nominal Watts	Avg. Life	Part Number	NSN	Manuf TCLP Results [units (mg/L) at chemical (Hg)]
T8 Ecologic Octron series, Medium Bi Pin							
3000	75	48	32	20,000	F032/730/ECO	6240-01-457-3789	0.09
3500	75			20,000	F32/735/ECO	6240-01-457-3792	
4100	75			20,000	F32/741/ECO	6240-01-457-3794	
3000	82			20,000	F32/830/ECO	6240-01-457-3798	0.11
3500	82			20,000	F32/835/ECO	6240-01-457-3806	
4100	82			20,000	F32/841/ECO	6240-01-457-3811	
T8 Ecologic Octron Curvalume (1-5/8 inch leg spacing), Medium Bi Pin							
3000	82	22.5	32	20,000	FBO31/830/ECO	6240-01-457-3814	
3500	82			20,000	FBO31/835/ECO	6240-01-457-3817	
4100	82			20,000	FBO31/841/ECO	6240-01-457-3825	

GE "ECOLUX "

Kelvin Temp	*CRI	Length (inches)	Nominal Watts	Avg. Life	Part Number	NSN	Manuf TCLP Results [units (mg/L) at chemical (Hg)]
T8 ECOLUX, Medium Bi Pin							
3000	78	48	32	20,000	F32T8/SP30/ECO	6240-01-454-0810	
3500	78			20,000	F32T8/SP35/ECO	6240-01-454-0817	
4100	78			20,000	F32T8/SP41/ECO	6240-01-454-0820	0.06
3000	86			20,000	F32T8/SPX30/ECO	6240-01-454-0824	
3500	86			20,000	F32T8/SPX35/ECO	6240-01-454-0827	
4100	86			20,000	F32T8/SPX41/ECO	6240-01-454-0831	
F40 Watt-Miser Ecolux, Medium Bi Pin							
3000	70			20,000	F40SP30/RS/WM/ECO	6240-01-454-0846	
3500	73			20,000	F40SP35/RS/WM/ECO	6240-01-454-0853	
4100	72			20,000	F40SP41/RS/WM/ECO	6240-01-454-0855	
3000	82			20,000	F40SPX30/RS/WM/ECO	6240-01-454-0858	
3500	82			20,000	F40SPX35/RS/WM/ECO	6240-01-454-0860	
4100	80			20,000	F40SPX41/RS/WM/ECO	6240-01-454-0864	
T12 F36 Watt-Miser Ecolux, Medium Bi Pin							
4150	62	96	32	12,000	F96T12/CW/WM/ECO	6240-01-454-0872	
3000	70			12,000	F96T12/SP30/WM/ECO	6240-01-454-0873	
3500	73			12,000	F96T12/SP35/WM/ECO	6240-01-454-0889	
4100	72			12,000	F96T12/SP41/WM/ECO	6240-01-454-0890	
3000	82			12,000	F96T12/SPX30/WM/ECO	6240-01-454-0896	
3500	82			12,000	F96T12/SPX35/WM/ECO	6240-01-454-0895	
4100	80			12,000	F96T12/SPX41/WM/ECO	6240-01-454-0899	

* CRI (Color Rendering Index)

USACHPPM TCLP Testing of 10 Philips Alto F3278/TL741 Fluorescent Lamps for Verification of Manufacturer TCLP Testing

Analytical Method: EPA 7470A

Date Analyzed: 7 May 2001

Sample	Result/Units Of Mercury	Method Detection Limit	Regulatory Limit of Mercury
Bulb-1	0.0300 mg/L	0.0100	0.2000 mg/L
Bulb-2	0.0500 mg/L		
Bulb-3	0.1600 mg/L		
Bulb-4	0.1200 mg/L		
Bulb-5	0.1200 mg/L		
Bulb-6	0.1100 mg/L		
Bulb-7	0.1900 mg/L		
Bulb-8	0.1500 mg/L		
Bulb-9	<0.0100 mg/L		
Bulb-10	0.0200 mg/L		

USACHPPM TCLP Testing of GE Ecolux Fluorescent Lamps for Verification of Manufacturer TCLP Testing

Analytical Method Used: EPA 7470A

Date of Analysis: 16 July 02

Sample	Result/Units Of Mercury	Method Detection Limit	Regulatory Limit of Mercury
5799001 1GE	<0.010 mg/L	0.0100	0.2000 mg/L
5799002 2GE	<0.010 mg/L		
5799003 3GE	<0.010 mg/L		
5799004 4GE	0.021 mg/L		
5799005 5GE	<0.010 mg/L		
5799006 6GE	<0.010 mg/L		
5799007 7GE	<0.010 mg/L		
5799008 8GE	<0.010 mg/L		
5799009 9GE	0.012 mg/L		
5799010 10GE	0.017 mg/L		

**USACHPPM TCLP Testing of Sylvania Ecologic Fluorescent Lamps for
Verification of Manufacturer TCLP Testing**

**Analytical Method Used: EPA 7470A,
Date of Analysis: 15 July 02**

Sample	Result/Units Of Mercury	Method Detection Limit	Regulatory Limit of Mercury
5799011 1 Sylvania	0.027 mg/L	0.0100	0.2000 mg/L
5799012 2 Sylvania	0.081 mg/L		
5799013 3 Sylvania	0.073 mg/L		
5799014 4 Sylvania	0.024 mg/L		
5799015 5 Sylvania	0.11 mg/L		
5799016 6 Sylvania	0.092 mg/L		
5799017 7 Sylvania	0.056 mg/L		
5799018 8 Sylvania	0.025 mg/L		
5799019 9 Sylvania	0.084 mg/L		
5799020 10 Sylvania	0.028 mg/L		
5799020 11 Sylvania	0.15 mg/L		
5799020 12 Sylvania	0.096 mg/L		
5799020 13 Sylvania	<0.010 mg/L		
5799020 14 Sylvania	<0.010 mg/L		
5799020 15 Sylvania	0.041 mg/L		

References

Defense Logistics Agency, Energy Efficient Lighting Catalog,
<http://www.dscpl.dla.mil/gi/general/Lighting/Linearfl.htm>Pg. , 58-70, June 7, 2000

GE Lighting, Certification of Analysis from Alpha Analytical Labs, Fax, 7 July, 2000

Philips Lighting Company, Alto Data, Fax, 7 July 2000
Press Information: "Philips Fluorescent Technology First to Pass EPA Waste
standard", June 6, 1995

Osram Sylvania, TCLP Test Results, Fax, 29 June, 2000

Title 40 Code of Federal Regulations, Part 261.24, Toxicity Characteristic, Table 1, July
1999

Walitsky, Paul, "Shedding Light On Fluorescent Waste", Econ. Pg. 22-23, 42, January
1996

**Hazardous and Medical Waste Program, Mr. Richard Price
U.S. Army Center for Health Promotion and Preventive Medicine
5158 Blackhawk Road
Aberdeen Proving Ground, MD 21010-5403
DSN 584-3651 or Commercial 410-436-3651**

