

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460



OFFICE OF AIR AND RADIATION

August 20, 2009

Mr. Ron Runkles
NEMA Industry Director
1300 North 17th Street
Suite 1847
Rosslyn, VA 22209

Mr. Terry McGowan
Director of Engineering and Technology
American Lighting Association
3574 Atherstone Road
Cleveland Hts., OH 44121

Dear Sirs:

It is with pleasure that EPA accepts the data provided in the attached electronic ballast spreadsheet from Universal Lighting Technologies.

This spreadsheet may be made available to light fixture manufacturers via posting to the NEMA/ALA designated Web site at www.nema.org/lampballastmatrix/. We will now accept listing on these matrices in lieu of full testing documentation per the ENERGY STAR for Residential Light Fixture Specification Version 4.2 for the following parameters:

- Input Power
- Lamp Start Time
- Power Factor
- Lamp Current Crest Factor
- Electromagnetic and Radio Frequency Interference
- Maximum Recommended Ballast Case Temperature During Normal Operation Inside A Fixture
- Ballast Case Hot Spot Location
- Ballast Frequency
- Transient Protection
- End of Life Protection
- Dimming
- Safety – Ballasts and “Non Edison base Fluorescent Adapters”

We should note that EPA accepts this data provided it adheres to the document we developed together entitled: ‘ENERGY STAR Standard Operating Procedures for Accepting Lamp Ballast Combinations from the Proposed NEMA/ALA Matrix’. Further, NEMA and ALA understand that this acknowledgement applies only to those lamp and ballast models listed on the current set of matrices and that future revisions to the lists must also be approved by EPA or its agents.

Sincerely,

A handwritten signature in black ink, appearing to read "Alex Baker".

Alex Baker, Lighting Program Manager
ENERGY STAR for Residential Light Fixtures

NEMA/ALA BALLAST MATRIX

Ballast Manufacturer Name:

Universal Lighting Technologies
4/27/2010

Updated:

Ballasts listed in this table meet the ballast-controlled performance requirements in the ENERGY STAR Program Requirements for Residential Light Fixtures, version 4.2. The fixture manufacturer can use data presented below when completing and submitting an ENERGY STAR Qualified Product Information (QPI) form to ENERGY STAR qualification. The fixture manufacturer is responsible to make sure selected lamp/ballast platforms meet all the required performance characteristics, and all required data not presented in this matrix (such as fixture safety documentation) is submitted to Energy Star with the QPI form.

Generic Lamp Designation	Number of Lamps Per Ballast	Ballast Model Number	Minimum Required Initial Lamp Lumens ¹	Minimum Required Lumens Per Watt	Input Power (Watts)	Ballast Factor	Lamp Start Time (ms)	Power Factor	Lamp Current Crest Factor	Ballast Hot Spot Location ²	Maximum Recommended Ballast Case Temp. ³ (°C)	Electromagnetic and Radio Frequency Interference ⁴ (Meets FCC Req.s?)	Ballast Frequency (kHz)	Transient Protection ⁵ (Meets Protection Req.s?)	End of Life (EOL) Protection ⁶ (Yes or N/A)	Max. Number of Lamps Shutdown at EOL	Dimming-Capable? ⁷ (Cont., 3-Way, No)	Safety Listing for Ballast (Yes/No)	Uses Line Voltage Socket Standard Design ⁸ ? (Yes/No)
F32T8	1	B1321120RH0ESC	2466	70	31	0.88	10.0	0.99	1.44	2.00"	75	Yes	30	Yes	N/A	N/A	No	Yes	No
F40T12ES	1	B134R120M-A	2767	70	34	0.86	65.0	0.98	1.7	1.75"	75	Yes	43	Yes	N/A	N/A	No	Yes	No
F40T12	1	B134R120M-A	3256	70	40	0.86	65.0	0.96	1.7	1.75"	75	Yes	43	Yes	N/A	N/A	No	Yes	No
F32T8	2	B2321120AF-A	2307	70	58	0.88	< 1000	0.97	1.70	1.3"	75	Yes	44	Yes	N/A	N/A	No	Yes	No
F32T8/U	2	B2321120AF-A	2386	70	60	0.88	< 1000	0.97	1.70	1.3"	75	Yes	44	Yes	N/A	N/A	No	Yes	No
F31T8/U	2	B2321120AF-A	2267	70	57	0.88	< 1000	0.97	1.70	1.3"	75	Yes	44	Yes	N/A	N/A	No	Yes	No
F25T8	2	B2321120AF-A	1750	70	46	0.92	< 1000	0.95	1.70	1.3"	75	Yes	44	Yes	N/A	N/A	No	Yes	No
F17T8	2	B2321120AF-A	1042	60	33	0.95	< 1000	0.88	1.70	1.3"	75	Yes	44	Yes	N/A	N/A	No	Yes	No
F32T8	2	B2321120RES-A	2227	70	56	0.88	43.0	0.58	1.64	4.50"	75	Yes	44	Yes	N/A	N/A	No	Yes	No
F25T8	2	B2321120RES-A	1750	70	46	0.92	34.8	0.56	1.64	4.50"	75	Yes	44	Yes	N/A	N/A	No	Yes	No
F17T8	2	B2321120RES-A	1021	60	32	0.94	54.0	0.53	1.68	4.50"	75	Yes	44	Yes	N/A	N/A	No	Yes	No
F32T8	1	B2321120RES-A	2311	70	35	1.06	32.0	0.54	1.48	4.50"	75	Yes	51	Yes	N/A	N/A	No	Yes	No
F25T8	1	B2321120RES-A	1296	50	28	1.08	34.0	0.51	1.52	4.50"	75	Yes	51	Yes	N/A	N/A	No	Yes	No
F17T8	1	B2321120RES-A	972	50	21	1.08	32.0	0.50	1.64	4.50"	75	Yes	51	Yes	N/A	N/A	No	Yes	No
F32T8/U	2	B2321120RES-A	2227	70	56	0.88	43.0	0.58	1.66	4.50"	75	Yes	44	Yes	N/A	N/A	No	Yes	No
F32T8/U	1	B2321120RES-A	2739	70	36	0.92	32.0	0.54	1.5	4.50"	75	Yes	51	Yes	N/A	N/A	No	Yes	No
F31T8/U	2	B2321120RES-A	2048	70	55	0.94	43.0	0.57	1.66	4.50"	75	Yes	44	Yes	N/A	N/A	No	Yes	No
F31T8/U	1	B2321120RES-A	2311	70	35	1.06	32.0	0.53	1.51	4.50"	75	Yes	51	Yes	N/A	N/A	No	Yes	No
F32T8	2	B2321120RES-G	2227	70	56	0.88	65.0	0.57	1.63	6.75"	75	Yes	47	Yes	N/A	N/A	No	Yes	No
F25T8	2	B2321120RES-G	1750	70	46	0.92	65.0	0.55	1.69	6.75"	75	Yes	47	Yes	N/A	N/A	No	Yes	No
F17T8	2	B2321120RES-G	1053	60	33	0.94	65.0	0.52	1.68	6.75"	75	Yes	47	Yes	N/A	N/A	No	Yes	No
F32T8	1	B2321120RES-G	2377	70	36	1.06	65.0	0.53	1.55	6.75"	75	Yes	53	Yes	N/A	N/A	No	Yes	No
F25T8	1	B2321120RES-G	1296	50	28	1.08	65.0	0.51	1.6	6.75"	75	Yes	53	Yes	N/A	N/A	No	Yes	No
F17T8	1	B2321120RES-G	1019	50	22	1.08	65.0	0.50	1.69	6.75"	75	Yes	53	Yes	N/A	N/A	No	Yes	No
F32T8/U	2	B2321120RES-G	2267	70	57	0.88	65.0	0.58	1.68	6.75"	75	Yes	47	Yes	N/A	N/A	No	Yes	No
F32T8/U	1	B2321120RES-G	2400	70	36	1.05	65.0	0.54	1.56	6.75"	75	Yes	53	Yes	N/A	N/A	No	Yes	No
F31T8/U	2	B2321120RES-G	2188	70	55	0.88	65.0	0.58	1.66	6.75"	75	Yes	47	Yes	N/A	N/A	No	Yes	No
F31T8/U	1	B2321120RES-G	2267	70	34	1.05	65.0	0.53	1.6	6.75"	75	Yes	53	Yes	N/A	N/A	No	Yes	No
F32T8	2	B2321120RH0ESC	2307	70	58	0.88	21.2	0.98	1.56	4.25"	75	Yes	27	Yes	N/A	N/A	No	Yes	No
F32T8	1	B2321120RH0ESC	2356	70	35	1.04	21.2	0.93	1.45	4.25"	75	Yes	31	Yes	N/A	N/A	No	Yes	No
F25T8	2	B2321120RH0ESC	1692	70	44	0.91	21.2	0.96	1.57	4.25"	75	Yes	26	Yes	N/A	N/A	No	Yes	No
F17T8	2	B2321120RH0ESC	1022	60	31	0.91	21.2	0.92	1.53	4.25"	75	Yes	26	Yes	N/A	N/A	No	Yes	No
F32T8/U	2	B2321120RH0ESC	2267	70	57	0.88	21.2	0.98	1.57	4.25"	75	Yes	27	Yes	N/A	N/A	No	Yes	No
F32T8/U	1	B2321120RH0ESC	2356	70	35	1.04	21.2	0.93	1.45	4.25"	75	Yes	32	Yes	N/A	N/A	No	Yes	No
F31T8/U	2	B2321120RH0ESC	2172	70	54	0.87	21.2	0.98	1.57	4.25"	75	Yes	26	Yes	N/A	N/A	No	Yes	No
F31T8/U	1	B2321120RH0ESC	2243	70	33	1.03	21.2	0.92	1.46	4.25"	75	Yes	32	Yes	N/A	N/A	No	Yes	No
F40T12ES	2	B234SR120M-A	2401	70	59	0.86	40.0	0.97	1.7	1.50"	75	Yes	43	Yes	N/A	N/A	No	Yes	No
F40T12	2	B234SR120M-A	2761	70	71	0.90	40.0	0.97	1.7	1.50"	75	Yes	43	Yes	N/A	N/A	No	Yes	No
F40T12	2	B240R120RH	2831	70	72	0.89	50.8	0.96	1.5	2.00"	75	Yes	26	Yes	N/A	N/A	No	Yes	No
F40T12	1	B240R120RH	2569	70	40	1.09	50.8	0.90	1.6	2.00"	75	Yes	25	Yes	N/A	N/A	No	Yes	No
F40T12ES	2	B240R120RH	2438	70	62	0.89	50.8	0.95	1.5	2.00"	75	Yes	26	Yes	N/A	N/A	No	Yes	No
F40T12ES	1	B240R120RH	2482	70	39	1.10	50.8	0.89	1.5	2.00"	75	Yes	26	Yes	N/A	N/A	No	Yes	No
F96T12ES	2	B2601120M-A	4176	70	105	0.88	80.0	0.95	1.7	1.75"	75	Yes	31	Yes	N/A	N/A	No	Yes	No
F72T12	2	B2601120M-A	4083	70	105	0.90	55.0	0.95	1.7	1.75"	75	Yes	31	Yes	N/A	N/A	No	Yes	No
F96T12ES	1	B2601120M-A	4239	70	66	1.09	50.0	0.90	1.7	1.75"	75	Yes	31	Yes	N/A	N/A	No	Yes	No
F48T12	2	B2601120M-A	2644	70	68	0.90	50.0	0.90	1.7	1.75"	75	Yes	31	Yes	N/A	N/A	No	Yes	No
F96T12	2	B2601120RH	5413	70	133	0.86	9.7	0.95	1.57	3.00"	75	Yes	26	Yes	N/A	N/A	No	Yes	No
F96T12	1	B2601120RH	5696	70	83	1.02	9.7	0.95	1.57	3.00"	75	Yes	26	Yes	N/A	N/A	No	Yes	No
F96T12ES	2	B2601120RH	4256	70	107	0.88	9.7	0.95	1.57	3.00"	75	Yes	26	Yes	N/A	N/A	No	Yes	No
F96T12ES	1	B2601120RH	4400	70	66	1.05	9.7	0.95	1.57	3.00"	75	Yes	26	Yes	N/A	N/A	No	Yes	No
F72T12	2	B2601120RH	4161	70	107	0.90	9.7	0.95	1.57	3.00"	75	Yes	26	Yes	N/A	N/A	No	Yes	No
F72T12	1	B2601120RH	4442	70	66	1.04	9.7	0.90	1.57	3.00"	75	Yes	26	Yes	N/A	N/A	No	Yes	No
F48T12	2	B2601120RH	2891	70	76	0.92	9.7	0.95	1.57	3.00"	75	Yes	26	Yes	N/A	N/A	No	Yes	No
F48T12ES	2	B2601120RH	2435	70	64	0.92	9.7	0.95	1.57	3.00"	75	Yes	26	Yes	N/A	N/A	No	Yes	No
F32T8	3	B3321120RH0ESC	2307	70	88	0.89	42.4	0.99	1.55	4.25"	75	Yes	24	Yes	N/A	N/A	No	Yes	No
F32T8	2	B3321120RH0ESC	2369	70	67	0.99	42.4	0.97	1.47	4.25"	75	Yes	27	Yes	N/A	N/A	No	Yes	No
F25T8	3	B3321120RH0ESC	1763	70	68	0.90	42.4	0.97	1.54	4.25"	75	Yes	24	Yes	N/A	N/A	No	Yes	No
F17T8	3	B3321120RH0ESC	1054	60	49	0.93	42.4	0.93	1.52	4.25"	75	Yes	24	Yes	N/A	N/A	No	Yes	No
F32T8/U	3	B3321120RH0ESC	2307	70	88	0.89	42.4	0.99	1.55	4.25"	75	Yes	24	Yes	N/A	N/A	No	Yes	No
F32T8/U	2	B3321120RH0ESC	2369	70	67	0.99	42.4	0.97	1.47	4.25"	75	Yes	27	Yes	N/A	N/A	No	Yes	No
F31T8/U	3	B3321120RH0ESC	2307	70	88	0.89	42.4	0.99	1.55	4.25"	75	Yes	24	Yes	N/A	N/A	No	Yes	No
F31T8/U	2	B3321120RH0ESC	2369	70	67	0.99	42.4	0.97	1.47	4.25"	75	Yes	27	Yes	N/A	N/A	No	Yes	No
F32T8	4	B4321120AF-A	2265	70	110	0.85	< 1000	0.96	1.70	4.25"	75	Yes	32	Yes	N/A	N/A	No	Yes	No
F31T8/U	4	B4321120AF-A	2224	70	108	0.85	< 1000	0.96	1.70	4.25"	75	Yes	32	Yes	N/A	N/A	No	Yes	No
F25T8	4	B4321120AF-A	1750	70	88	0.88	< 1000	0.95	1.70	4.25"	75	Yes	32	Yes	N/A	N/A	No	Yes	No
F17T8	4	B4321120AF-A	1011	60	62	0.92	< 1000	0.90	1.70	4.25"	75	Yes	32	Yes	N/A	N/A	No	Yes	No
F32T8	4	B4321120RES-A	2193	70	109	0.87	43.0	0.68	1.64	4.50"	75	Yes	44	Yes	N/A	N/A	No	Yes	No
F25T8	4	B4321120RES-A	1653	70	85	0.90	34.8	0.68	1.64	4.50"	75	Yes	44	Yes	N/A	N/A	No	Yes	No
F17T8	4	B4321120RES-A	995	60	61	0.92	54.0	0.70	1.68	4.50"	75	Yes	44	Yes	N/A	N/A	No	Yes	No
F32T8	3	B4321120RES-A	2236	70	92	0.96	32.0	0.68	1.48	4.50"	75	Yes	51	Yes	N/A	N/A	No	Yes	No

Generic Lamp Designation	Number of Lamps Per Ballast	Ballast Model Number	Minimum Required Initial Lamp Lumens ¹	Minimum Required Lumens Per Watt	Input Power (Watts)	Ballast Factor	Lamp Start Time (ms)	Power Factor	Lamp Current Crest Factor	Ballast Hot Spot Location ²	Maximum Recommended Ballast Case Temp. ³ (°C)	Electromagnetic and Radio Frequency Interference ⁴ (Meets FCC Reqs.?)	Ballast Frequency (kHz)	Transient Protection ⁵ (Meets Protection Reqs.?)	End of Life (EOL) Protection ⁶ (Yes or N/A)	Max. Number of Lamps Shutdown at EOL	Dimming-Capable? ⁷ (Cont., 3-Way, No)	Safety Listing for Ballast (Yes/No)	Uses Line Voltage Socket Standard Design ⁸ ? (Yes/No)
F25T8	3	B4321120RES-A	1690	70	71	0.98	34.0	0.69	1.52	4.50"	75	Yes	51	Yes	N/A	N/A	No	Yes	No
F17T8	3	B4321120RES-A	1020	60	51	1.00	32.0	0.70	1.64	4.50"	75	Yes	51	Yes	N/A	N/A	No	Yes	No
F32T8/U	4	B4321120RES-A	2198	70	108	0.86	43.0	0.66	1.66	4.50"	75	Yes	44	Yes	N/A	N/A	No	Yes	No
F32T8/U	3	B4321120RES-A	2161	70	88	0.95	32.0	0.66	1.5	4.50"	75	Yes	51	Yes	N/A	N/A	No	Yes	No
F31T8/U	4	B4321120RES-A	2116	70	104	0.86	43.0	0.67	1.66	4.50"	75	Yes	44	Yes	N/A	N/A	No	Yes	No
F31T8/U	3	B4321120RES-A	2088	70	85	0.95	32.0	0.67	1.51	4.50"	75	Yes	51	Yes	N/A	N/A	No	Yes	No
F32T8	4	B4321120RH0ESC	2261	70	115	0.89	39.6	0.98	1.58	2.00"	75	Yes	27	Yes	N/A	N/A	No	Yes	No
F32T8	3	B4321120RH0ESC	2261	70	94	0.97	39.6	0.97	1.52	2.00"	75	Yes	30	Yes	N/A	N/A	No	Yes	No
F25T8	4	B4321120RH0ESC	1711	70	88	0.90	39.6	0.97	1.56	2.00"	75	Yes	27	Yes	N/A	N/A	No	Yes	No
F17T8	4	B4321120RH0ESC	1011	60	62	0.92	39.6	0.92	1.53	2.00"	75	Yes	27	Yes	N/A	N/A	No	Yes	No
F32T8/U	4	B4321120RH0ESC	2261	70	115	0.89	39.6	0.98	1.58	4.25"	75	Yes	27	Yes	N/A	N/A	No	Yes	No
F32T8/U	3	B4321120RH0ESC	2261	70	94	0.97	39.6	0.97	1.52	4.25"	75	Yes	30	Yes	N/A	N/A	No	Yes	No
F31T8/U	4	B4321120RH0ESC	2261	70	115	0.89	39.6	0.98	1.58	4.25"	75	Yes	27	Yes	N/A	N/A	No	Yes	No
F31T8/U	3	B4321120RH0ESC	2261	70	94	0.97	39.6	0.97	1.52	4.25"	75	Yes	30	Yes	N/A	N/A	No	Yes	No
E2C65W/GRY10q-3	1	CBD-165C-120	4232	60	67	0.95	261	0.55	1.54	0.80"	75	Yes	42	Yes	N/A	N/A	Continuous	Yes	No
F2D55W/GRY10q-3	1	CBD-165C-120	3663	60	58	0.95	275	0.52	1.54	0.80"	75	Yes	42	Yes	N/A	N/A	Continuous	Yes	No
E2C58W/GRY10q-3	1	CBD-165C-120	3474	60	55	0.95	264	0.55	1.54	0.80"	75	Yes	42	Yes	N/A	N/A	Continuous	Yes	No
CFTR32W/Gx24q	1	ES3020G	2100	60	35	1.00	< 1000	0.99	1.5	0.75"	75	Yes	41	Yes	Yes	1	No	Yes	No
CFTR26W/Gx24q	1	ES3020G	1373	50	28	1.02	< 1000	0.99	1.6	0.75"	75	Yes	41	Yes	Yes	1	No	Yes	No

1. Minimum Required Initial Lamp Lumens needed for compliance. Refer to "Fluorescent Lamp Matrix" for Rated Initial Lamp Lumens.

$$\text{Minimum Required Initial Lamp Lumens} = \frac{\text{Minimum Required Lumens Per Watt} \times \text{Input Power}}{\text{Number of Lamps Per Ballast} \times \text{Ballast Factor}}$$

2. Hot spot location measured from end of case where line leads exit, unless otherwise indicated.

3. Maximum recommended ballast case temperature during normal operation inside a fixture.

4. Indicate "Yes" if ballast meets FCC requirements for consumer use.

5. Indicate "Yes" if ballast meets transient protection requirements.

6. All ballasts that operate lamps sized T4 and smaller must contain an end of life protection circuit. For ballasts that operate T4 or T5 lamps, they must be tested in accordance to IEC 61347-2-3 Amendment 1 to Edition 1 2004-06 (or ANSI C82.11-2005, upon its release). For ballasts that operate multiple lamps and are required to have end of life protection, the ballast must shut down no more than two lamps when one of the lamps has reached end of life.

7. If ballast is dimmable, indicate "Continuous" or "3-way" dimming. Otherwise, indicate "No".

8. EPA encourages the use of the Line Voltage Socket standard design for ballasts that drive lamps 26W and lower, but does not require its use at this time. For more information, see: www.lrc.rpi.edu/programs/lightingTransformation/lineVoltage/index.asp

DISCLAIMER: The information on this matrix was compiled from data received from ballast manufacturers. NEMA and ALA disclaim all implied warranties including the quality or accuracy of this information, and there is no warranty that this information, the efforts of NEMA and/or ALA, or the matrix will fulfill any of your particular purposes or needs. If there are questions about a specific manufacturer's listing, the manufacturer should be contacted.