QUICK REFERENCE TROUBLESHOOTING MATRIX
FLUORESCENT LIGHTING

9/00

Ballast/Lamp Factors:

	Ballast				Lamp							
Problem/Cause	**Ballast Improperly Operates Lamps**	**Wrong Ballast**	**Defective Ballast**	**Ballast at End of Life**	**Wrong Lamps for Ballast**	**Poor Lamp/ Socket Contact**	**Normal Attrition of Cathode Coating**	**Normal End of Life**	**Gas Leak**	**Impurities in Lamp**	**Normal Failures/ Short Burn Cycle**	**Normal Lumen Drop off**
Lamps that Fail to Light	X	X	X	X	X	X		X	X	X	X	
Slow Starting	X	X	X	X	X	X			X	X		
New Lamps Fail within a Few Days	X	X	X		X	X			X	X		
Short Lamp Life	X	X	X		X	X		X	X	X	X	
Snaking/Flickering Lamps	X	X			X	X		X	X	X		
Reduced Light Output	X	X			X					X		X
Dim Center	X	X							X	X		
Dark Ends	X	X			X	X	X	X				

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Other Factors:

	Circuit /Wiring/ Voltage				External Conditions				Starter [1]	
Problem/Cause	**Blown Fuse**	**Improper Wiring/ Circuit**	**Line Voltage too high or too low**	**No Ground Plane [2,3]**	**High [2,3,4] Humidity**	**Dirty Fixture**	**Air Currents (drafts)**	**Extreme Tempera-ture**	**Wrong or Defective Starter**	**Starter at End of Life**
Lamps that Fail to Light	X	X	X	X	X	X		X	X	X
Slow Starting	X	X	X	X	X	X		X	X	X
New Lamps Fail within a Few Days		X	X						X	
Short Lamp Life		X	X						X	X
Snaking/Flickering Lamps		X	X				X		X	
Reduced Light Output			X			X	X	X	X	
Dim Center		X						X	X	
Dark Spots on Lamps							X	X		
Dark Ends		X	X					X	X	

[1] preheat
[2] trigger-start
[3] rapid start
[4] instant start

Other Issues to consider…

- More about dark spots or streaks
  - The dark spots are droplets of condensed mercury. They sometimes appear in new lamps and will evaporate and disappear after the lamps are operated for a few hours.
  - The dark spots or streaks of condensed mercury may also appear if a heat-conducting object, such as a fixture louver or reflector, is too close to the bulb wall of the lamp. The object is conducting heat away from the bulb wall of the lamp and creating an unacceptable cold spot. The distance between the object and the bulb wall must be increased in order to eliminate the problem. Rotating the lamp 180° may eliminate the spots/streaks temporarily, but they will return as long as a section of the bulb wall is too cool.
- Lower Light output than expected
  - Check the ballast factor of the ballast. You may need to refer to the ballast manufacturer's catalog for this information. The ballast factor is the percentage of the published lumens (measured on an ANSI reference ballast) that the actual ballast delivers.
  - Check for other equipment in the facility that may be reducing the line voltage at the ballast.
  - Don't forget that fluorescent lamps are temperature sensitive. Ambient temperatures that are too high or too low will cause the lamps to produce less light. Air currents (drafts) may be cooling the lamps and causing them to produce less light. Consider adding plastic tube guards or using enclosed fixtures in low temperature or drafty applications.
- Lamps slow to warm up to full brightness
  - Compact fluorescent amalgam lamps have a longer warm-up time than non-amalgam (mercury) lamps. Non-amalgam (mercury) lamps reach full brightness in about 180 seconds. Amalgam lamps will require a longer time.
  - PENTRON T5 (and competitors' similar lamps) may have longer warm-up times than those typical for T8 OCTRON or T12 linear fluorescent lamps.
  - How cold is it? Remember, all fluorescent lamps are temperature sensitive. Consider adding plastic tube guards or using enclosed fixtures in low temperature applications.
- Lamp color
  - Allow new lamps to operate for 100 hours then check for color variations.
  - Mercury compact fluorescent lamps are sensitive to operating position – position can affect color and lumen output. Amalgam compact fluorescent lamps are less sensitive to position, so this may make them a better choice for some applications.
  - Check for multiple production runs. There can be slight variations and all lamps still be within standard.
  - Lamp color, as well as light output, may also be affected if a heat-conducting object is too close to the lamp bulb wall.

- New lamps will not start
  - If this is a newer T5 or smaller diameter lamp installation, the ballasts may have end-of-life sensing circuits. Try turning off the power, then turning it back on to reset the sensing circuit.
- Dimming fluorescent lamps
  - In most applications it is not necessary to season fluorescent lamps before dimming them. If there is a question, the best practice is to season the lamps before dimming them.
- Cold Temperature Applications
  - Is the ballast appropriate for the application? Check the ballast label for the minimum starting temperature. If you can not determine this from the ballast label, record the manufacturer's name and model # to check later.
  - If you have a 2-pin compact fluorescent lamp, the starter is in the lamp and it determines the minimum starting temperature for the lamp. Check the product information bulletins for the minimum starting temperatures for these lamps. If you have a 4-pin compact fluorescent lamp, the ballast determines the minimum starting temperature of the lamp.
  - Do not use SuperSaver lamps. Their krypton gas fill makes them more sensitive to cold and they should not be used if the ambient temperature is less than 60° F. Use full wattage lamps instead.
  - OCTRON lamps are suitable for cold applications when used with the appropriate ballasts.
  - If lumens are low or lamps are slow to reach expected brightness, consider using tube guards or enclosed fixtures.

Things to always check…

- Exchange a known good lamp with a suspected defective lamp.
  - If the problem "follows" the suspected defective lamp to the new location, the problem may be with the lamp.
  - If the problem stays with the fixture, the problem is with a system component other than the lamp.
- Are the lamp and ballast properly matched?
  - If you can not determine this from the ballast label, record the ballast manufacturer's name and model # to check later.
- Is the ballast properly matched to the supply voltage?
- Is the ballast wired properly? A wiring diagram appears on the label of each Osram Sylvania ballast, in the printed catalog and in the electronic catalog. You may also want to refer to the NEMA white paper titled "Wiring Requirements for T8 Lamps with Instant Start Ballasts". This document is available through the NEMA web site.