

Application Note

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Laser Life for SOLAIR 1100+

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Lighthouse Worldwide Solution's SOLAIR 1100+ Laser Tube Lifetime

Overview

The Lighthouse SOLAIR 1100+ particle counter has been designed to achieve superior laser life performance in a HeNe based laser particle counter. This extended lifetime is made possible by using proven hard sealed HeNe laser technology. Over twenty years of experience and multiple process improvements are incorporated into every laser tube manufactured for Lighthouse products.

The purpose of this document is to provide additional information about the life span of the HeNe laser tube inside the SOLAIR 1100+.



Hard Sealing of the HeNe Laser

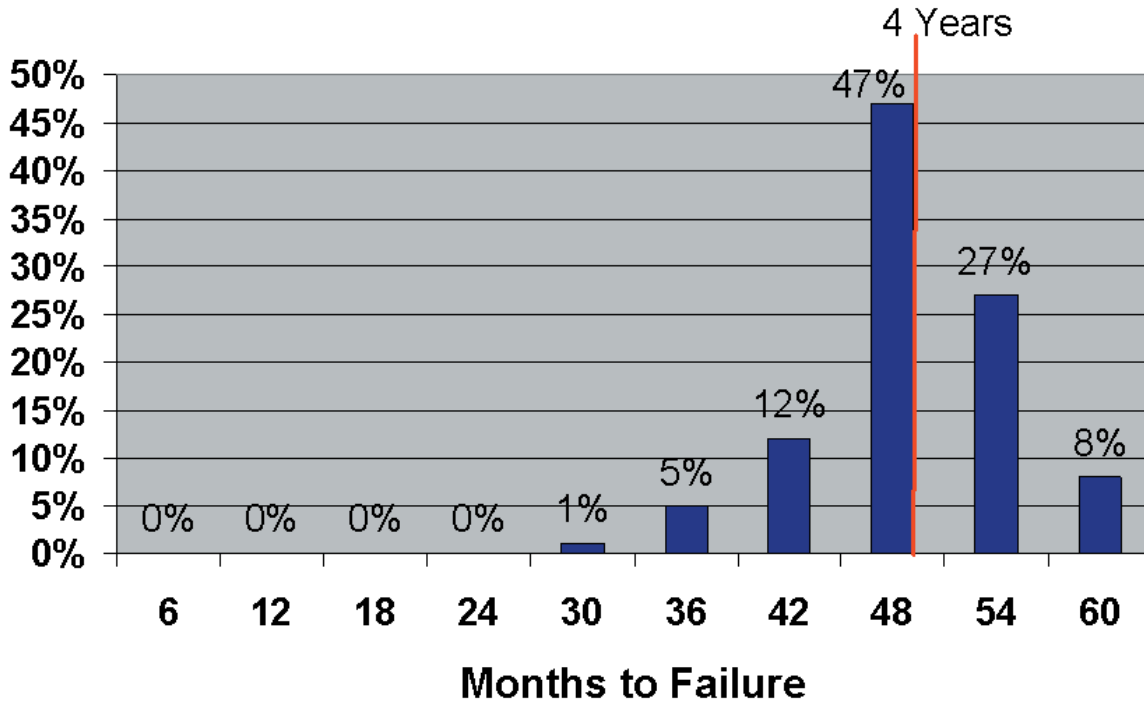
There are two common ways to seal in the HeNe gas inside of a laser tube, soft seal and hard seal. The soft seal process uses epoxy to seal the point at which the HeNe gas is inserted into the laser tube. Over time, this type of seal will begin to leak, thus shortening the life of the laser tube. The second, preferred, method is to hard seal the tube. After the HeNe gas is injected into the tube, the opening is welded shut. The weld stops any type of leakage, thus extending the life of the laser tube. The SOLAIR 1100+ uses a hard seal laser tube. The methods for hard sealing our laser tubes have been perfected through years of constant improvement. These ongoing efforts, over a twenty year timeframe, have resulted in a significant increase in the lifetime of tubes manufactured with this process.

Testing

Two sets of data have been collected to demonstrate the lifetime of the Lighthouse products. The first data set is from in-house life testing performed on multiple SOLAIR 1100+s over a 2 year period. The second set of data was collected directly from units that have been running in the field for no less than 2 years. The results of both of these tests were then combined to produce the MTTF chart that appears below. Because multiple units were tested over a two year time frame, we can use the collected data to extrapolate the estimated lifetime with greater than 95% confidence.

Please note that laser life can and will vary from unit to unit. This variation depends on several factors such as frequency of use, environmental conditions, and proper maintenance.

MTTF of Laser Tube



Summary

The above information details the Lighthouse design and testing of the laser tube used in the SOLAIR 1100+. The combined testing results show the laser life to be between 30 and 60 months, with the highest probability being between 48 to 54 months, or 4 to 4.5 years.

To date, Lighthouse Worldwide Solutions has seen zero laser tube failures within the product life of the SOLAIR 1100+ series.

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