

## **Why choose UV laser over other wire marking methods?**

Many involved in the wire marking and processing industry tend to ask, “Why should I invest in a laser marker,” or “what can justify such a purchase?” Small businesses are particularly sensitive to such concerns. Many believe that laser wire marking is for large production only, or that it is too expensive to pay for itself. However, once all factors are considered, laser marking is the best choice compared to other wire marking methods, and regardless of a company’s production requirements, UV laser will save money throughout its lifetime and will prove to be more efficient than any other method.



### **Laser wire markers are superior to hot stamping in every respect:**

The most common method for marking wires remains hot stamping, a technique in use since World War II. However, in light of recent events and technological advances, this method has proven both impractical and dangerous. The hot-stamp method is out-dated and takes far longer to mark a wire than a UV Laser marker requires. While Laser wire marking machines mark characters through its font mask (software controlled), hot stamping still requires the user to manually change the characters, taking up the operator’s time and costing the business time and money. The MRO 200 and ULYS Modena laser wire markers are PC based and fully automated which allows for much higher productivity and user friendliness. Moreover, the act of burning characters into the wire takes a lot longer than the laser process which quickly tans (darkens) the wire insulation. Laser wire markers are a lot faster and require less operator time, thus increasing the business’s workload capabilities and sometimes even allowing it to take on marking jobs for third parties.

Hot stampers cannot mark on twisted wires and cables. The LASELEC Laser wire marking machines can adapt to a twisted surface and make markings that are every bit as clear as on a smooth wire. LASELEC goes the extra distance by making such adjustments through the software, thus eliminating any need to switch out wire dice or make any other manual adjustments.

Furthermore, Teflon wires are continuing to grow in popularity. Those using a hot stamping machine will have trouble marking on Teflon wires. LASELEC Laser wire markers, meanwhile, have no problem marking on Teflon wiring.

Unlike hot stampers, LASELEC lasers can also safely mark on thin-insulated and small gauge wires without any risk to the integrity of the cable. LASELEC wire markers are capable of automatically adjusting to and marking as large as a 6 gauge and as small as a 26 gauge wire.

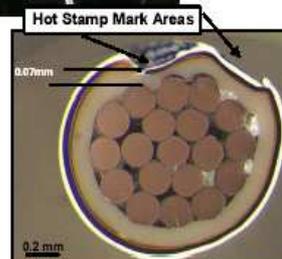
Finally, hot stamping is an aggressive marking method. Basically using a hot stamper means the wire is getting burned! This puts the wire at risk of being damaged before it is even installed in the aircraft. This has led to many tragedies, including infamous crashes such as TWA 800. Hot stamping requires all processed wires to be carefully checked before it is installed, costing a business even more time and money after the wire has already been marked! Checking the wires is not only time consuming, but it can also lead to human error. To make matters more difficult, the FAA adds new restrictions and regulations every year concerning the hot stamp method. It is only a matter of time before it becomes outlawed.

Many groups have investigated and found that hot stamping is not only inefficient and dangerous, but it should also be avoided. The Aging Transport Systems Rulemaking Advisory Committee (ATSRAC) was spearheaded by major organizations such as Boeing, Airbus, the FAA, TYCO Electronics, Bombardier, Cessna, and several government regulatory committees from France, Britain, and Canada. The [Wire Systems Certification Requirements Harmonization Working Group final report to ASTRAC](#) official documentation states on p. 29 that *“the use of hot stamp printing of wire in aerospace applications is not recommended. Good industry practices and standards such as AS50881 do not support the use of hot stamp wiring.”*

[AIR WORTHINESS DIRECTIVES for Electrical Wiring Interconnection System](#) states on page 61 that *“Certain wire marking methods have potential to damage wire insulation. Hot-stamp marking is one such method. According to SAE (Society of Automotive Engineers) aerospace information report AIR5575, ‘Hot Stamp Wire Marking Concerns for Aerospace Vehicle Applications’, the hot-stamp marking method is not well suited for today’s generation of thin wall aircraft wiring.”* It also states that *“If damage to the insulation occurs during the marking process, it may fail later in service after exposure to the sometimes-harsh environmental conditions of aircraft use.”*

The Australian government is heavily discouraging the use of hot stamping. According to the [Airworthiness Bulletin on March 16<sup>th</sup> of 2007](#), *“Hot stamp marking directly on the insulation of aircraft electrical wire and cable is not recommended due to the degradation that may be caused to the insulation and because alternate, improved identification methods are available.”* They recommend that *“hot stamp marking of wire and electrical/optical cable should not be used.”*

To illustrate the danger of hot stamping, the pictures below are of TWA flight 800 as released by the United States Air Force Research Laboratory found on p. 6 of their [Managing Wire Systems Integrity on Aerospace Vehicles](#) document:



- Identified wiring damage in areas traditionally not inspected, showed visual inspection limitations in locating wiring defects.
- Showed how a low voltage electrical system could become a fuel ignition source.

LASELEC's UV Laser wire marking, on the other hand, is the safest method to mark cables and wires. It only tans the insulation, leaving a permanent mark and maintaining the integrity of the wire. Unlike hot stamping the process is fast, efficient, and 100% safe. Wires are not damaged and there is no need for post-mark treatment (no spark tests, etc.) or inspection. LASELEC's Laser wire marking machines take wire safety even further with its various detectors which alert the user of any damaged wire before it is processed, thus saving time and money and contributing to safe wire handling practices.



Some companies are concerned with the initial cost of purchasing a laser wire marker. What many companies fail to see is that regardless of the wire demands, Laser

## Insulation Damage by Hot Stamp Printing Process Wiring Located in High Moisture Environment

marking will save the business money in terms of time, maintenance, and operator cost. LASELEC has a long history with laser wire markers as their first machines were installed over 20 years ago. In terms of the next

quarter, hot stampers are cheaper. In terms of the next quarter century LASELEC laser wire markers are the best option.

LASELEC laser marking is the future of wire processing, while hot stamping is barely holding on because of its cheaper initial purchase. In the end, that is the only argument for a hot stamper. If a business is looking for a temporary solution and ready to spend a lot of money down the road, they might consider a hot stamper. For the business looking to buy a machine that is safe, efficient, highly productive, and built to service the wire marking industry for generations to come, buy a LASELEC Laser wire marker.

### **LASELEC Laser wire markers are more practical and efficient than heat shrinking**

Heat shrinking is a popular solution for marking aeronautical wire. However there are several significant drawbacks that come with this method. One is that it is highly inefficient. Heat shrinking is a long and labor-intensive process. A user must mark the tubing manually, mark the wire and cut it and the tubing manually (and with precision), insert it over the wire manually, heat both ends of the wire manually, then insert the wire into its destination. Compare that to a Laser wire marker which marks the wire directly and automatically, then cuts it to length automatically. That's all! No need for post mark treatment.



*Above: Laselec Laser Wire Marking Sample  
(Photo Dubourg)*

Another disadvantage of heat shrinking is that dirt or grime can get into the tube and be inserted over the wire. This happens often in maintenance settings where the operator heat-shrinks and also installs the wires. The grease/dirt is caught in the tubing and makes the wiring slippery and difficult to install. This will not only increase labour hours but will also frustrate workers. With Laser wire markers, there are no tubes that need to be applied. The wire that goes into the machine is the wire that comes out. Dirt and grime cannot get

into any crevasses, making laser-marked wire very easy to handle.

Heat shrinking fails to address the needs of business looking to expand, which require a method that optimizes efficiency, cost, and speed. LASELEC laser markers addresses all these issues, reducing the need for post-mark treatment and eliminating the cost of applying more resources over the wire (tubing). Companies with their eye focused on long term growth, cost savings, and improved capacity (not to mention safety) will inevitably purchase the LASELEC Laser wire marker.

## **Laser marking's advantages compared to ink jet systems**

It is true that ink jet wire markers are very fast and can mark at higher speeds than LASER markers. However they present multiple disadvantages compared to a LASELEC UV Laser marking system.

Ink jets are a non-permanent marking method. Liquids that touch the markings, such as gasoline or jet fuel, can remove or smear the mark on the wire. The results? Maintenance workers cannot determine what the wire marking is and they have to replace a perfectly good wire (and sometimes a whole harness), increasing supply costs as well as wasting valuable resources. It can also lead to dangerous results, as a smeared number may be misinterpreted and lead to faulty wiring. The LASELEC UV Lasers tan the wire insulation, creating a permanent mark; it is fast, and easy to use. Rub gas, acetone, or any other substance on the wire and the marking will not fade. There will be no need to prematurely change out wires.

Marking with an ink jet also leads to high maintenance costs. Part of the daily maintenance on Ink Jets involves cleaning the ink applicator, checking if the wire is smearing the ink, checking for fading ink, and changing the cartridge. This leads to very high maintenance costs, increased down time, and daily consumables thus adding to the mounting operating costs. UV Laser wire markers require no ink as all the marking comes from the laser itself. LASELEC machines have no daily consumables and maintenance; they offer reduced maintenance time and costs. Meanwhile, ink jet systems must be cleaned every day with consumables that only add to mounting operating costs and serve to frustrate its user.



Marking with an ink jet system is also prone to fade in the long run. While liquids can immediately compromise the wire identification mark, time can also cause the ink to fade, which is especially a concern in the harsh environment of an aircraft. This leads once more to perfectly good wire being discarded, increasing supply costs and using up resources. LASELEC's laser identification is permanent; as long as the wire exists, so will the marking.

More and more companies are using Teflon wiring to meet their electrical needs. Ink jets have a fatal flaw in that they do not mark remotely well on these wires. Ink will simply smear and smudge, leading to poor marks that make the wire unusable. LASELEC's Laser wire markers have no problem marking on Teflon wires, as they cannot smear or run over the wire.

Ink jet marking is a quick method but it is also maintenance-intensive and inefficient. LASELEC's UV Laser wire marking is fast, with low maintenance, low operating costs, and high efficiency. It is a permanent solution to an industry's wire marking needs. Ink jets cannot meet the needs of today's industry seeking to limit costs and improve quality. Laser wire markers meanwhile can make such a claim.

### **LASELEC Laser wire marking: the most efficient and advanced solution**

LASELEC Laser wire marking is a fast, efficient, and a long term solution for wire marking. The greatest asset is that these machines pay for themselves, generally in a handful of years.



LASELEC machines increase marking capacity, and are safer, more efficient, and permanent. They will save its user operating costs no matter how much or how little they mark.

For more information on laser wire markers please contact us at:

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