

# Laser marking in the aircraft industry

## UV laser marking of cables

### Case Studies



### The Austrian armed forces

The armed forces are responsible for the military defence of the country. This also includes the protection of constitutional buildings, the job of maintaining order and security in the country and providing help during events resulting from elemental forces and large scale accidents. The military airfield 3 in Hürsching is responsible for the helicopters type **AugustaBell 212**. The main task is the regular maintenance and repair as well as modifications to maintain and improve the usage value of the aircrafts. Sometimes helicopters are completely rebuilt.

### The application

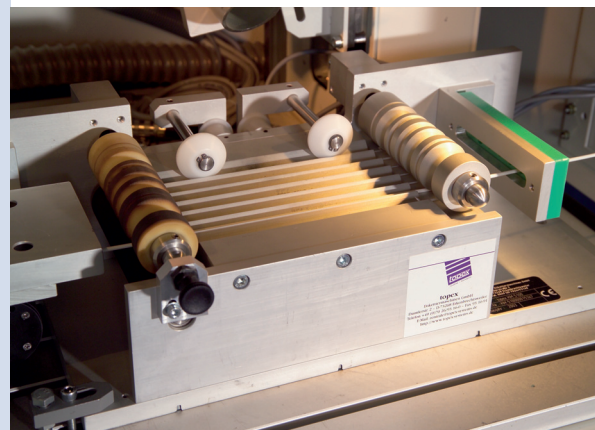
During servicing, maintaining or rebuilding of an aircraft, very often complete aircraft systems need to be replaced by new cables. This is particularly important for helicopters, as helicopters are exposed to strong vibrations as a result of their construction, and this has a negative effect of many mechanical and electronic components. Most of these cables are coated with Teflon and each one must be individually marked before fitting. This is precisely defined by the **MIL and SAE standards** (Aviation Safety and Laser Wire Marking, UV laser wire marking). Precise labelling of each cable also makes it easier for the technicians to service the aircraft.



### The challenge

Most of the cables are provided with a Teflon coating which reacts badly to traditional laser marking as it produces little colour change. At the same time, a maximum penetration depth for the marking in the coating is prescribed by all the relevant standards. Legible marking with standard Nd:YAG lasers is too deep and does not correspond to the prescribed standards.

High demands are also made on the durability of the cable labelling: it must be resistant to oil, fuel, exhaust fumes and the effects of the weather. Laser marking has proved to be resistant to these influences. It also offers unbeatable advantages with regard to flexibility (small numbers of units and a large number of different markings) and chemical stability.



### The Trotec solution

A **triple frequency Nd:YAG laser** ("UV laser") was installed with workstation and cable transport unit. The triple frequency reduces the wavelength to 355 nm. This achieves a good colour change on white Teflon material, which is well below the penetration depth into the material laid down in the standards. Conformity to the **MIL standards** was checked and confirmed by a legally sworn expert in a series of tests. The workstation combined with the cable transport unit offers the **greatest security** with a **high level of comfort** for the user at the same time.

**trotec**<sup>®</sup>  
laser engraving technology

**Worldwide Leading Laser Engraving Technology**

Linzer Str. 156, A-4600 Wels, Tel. +43 / 72 42 / 239-0, Fax +43 / 72 42 / 239-7380, [www.troteclaser.com](http://www.troteclaser.com), [sales@trotec.net](mailto:sales@trotec.net)