About IPLOCA

With members in more than 40 countries, IPLOCA is proud to represent some 250 of the key players in the onshore and offshore pipeline construction industry world wide.

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Laser Cleaning

the Next Revolution in Industrial Cleaning

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Lasers are devices that produce intense beams of light which is a focused energy spot. Laser can travel over great distances with a brightness which exceeds that of the sun. By mastering this incredible amount of energy and since laser technology is very reliable today, the technology offers a wide area of applications from healthy medical devices to industrial applications.

Since the late 1990's there is a growing consciousness to protect the environment. The industrial revolution is at the base of our wealth today and if we want to keep it we need to tackle actual environmental concerns. In addition, cost driven reasons and eco foot print concerns are additional arguments for a new approach. Laser cleaning is fully aligned with this approach. Affordable acquisition costs, easy to use equipment and a very reliable technology support the growing success of laser cleaning within the industry. When large surfaces need to be treated or when very tough material needs to be eliminated, grit blasting and chemical solutions are the primary solutions for the time being. Fortunately industrial innovation is looking for other cleaning solutions such as: better surface cleaning, higher precision and repeatability of the cleaning path. (Figure 1) New production processes are challenges where only laser cleaning fits.

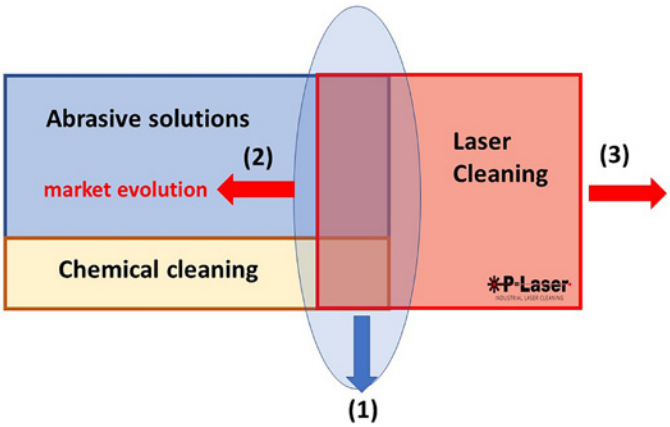

Figure 1: (1) new applications today, (2) replacing actual solutions, (3) new opportunities based on the evolution of the laser technology.

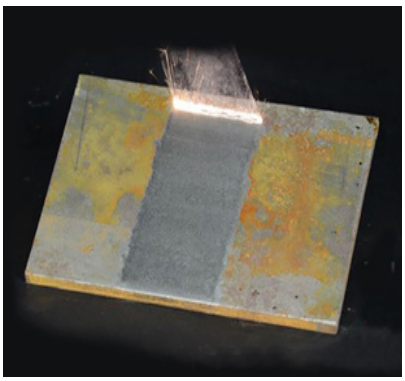

Figure 2

Figure 3

The development of laser technology is accelerating. Previous methods for the generation of the laser beam based on YAG and CO2 sources are now switching to fibre-laser technology which means a maintenance free source and a much more reliable equipment. The life time is up to 40,000 hrs in comparison to classic YAG laser with a max life time of 10,000 hrs and a lot of maintenance is required.

IPLOCA members are mostly confronted with metal applications which are the most interesting application fields. Before being assembled, steel parts need to be cleaned from any organic dirt such as oil, and in depth derusting before welding – and after welding before getting a protection coating. (Figure 2) An improvement of those activities of an assembly process avoids any quality concerns that can show up later on. Different studies at universities and special laboratories have clearly confirmed the improved cleaning performances against other traditional cleaning solutions.

Better welding quality and adhesion of coatings after the welding process is what is being looked for! A basic 100W system (Figure 3) consumes roughly 500W electrical energy will already surprise you with its cleaning results.

In contrast with some other techniques, laser cleaning is very suitable for integration in automated assembly systems. Robots and electro - mechanical manipulators with integrated cleaning and welding processes can repeatedly do a perfect job over and over again.

In addition to the quality concerns, laser cleaning offers a wide range of other advantages: apart from having to wear appropriate goggles there is no special protection for the operator, in comparison to grit blasting and chemical cleaning where special equipment is required. The laser equipment is much easier to transport and the startup time is only the time necessary to connect the power plug. Laser technology is not abrasive so it will not damage the material to be cleaned and the operation parameters of the system are very easy to adapt. No consumables (sand,chemicals, etc.) are needed which simplifies and reduces the operational costs by a factor of 10.

An integrated or external suction system will collect the dust for ease of processing afterwards. Although the laser technology has today reached performance levels above expectations by the industry, there is still room for innovation. Integration of a wide range of upcoming sensors will improve the overall intelligence of a laser cleaning system. Optimisation of the focus distance, online analysis of the dirt and the population of database to optimise the projected laser pattern on the material are some of the many research fields where laser cleaning will definitively make a breakthrough.

For more information's :

P-laser Belgium

www.p-laser.com

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