2021 Award Nomination

Title of Innovation:

QF-Compact laser cleaning system

Nominee(s)

Jean Claude Philippron, P-Laser

Category:

(select one below)

Coatings and Linings	Instrumentation
Cathodic Protection	Testing
Materials Design	Modeling/Risk Assessment
Chemical Treatment	Other: Oxide Removal

Dates of Innovation Development:

(from [April, 2018] to [January, 2019])

Web site: https://www.p-laser.com/products/compact-series

Summary Description:

The laser cleaning industry needed our systems to become smaller and smaller. We accepted the challenge and built the smallest laser cleaning system the world has ever seen. Coming in at 13 kg and measuring 485x225x330mm, it will be a solid competitor for years to come. The QF-Compact allows operators to be as mobile and versatile as possible. The device is plug and play, making ecological and safe cleaning a possibility for many different applications and industries.

Laser cleaning has proven to be a good alternative to sand blasting, ice blasting, brushing and chemical cleaning of corrosion. Industrial laser cleaning - or ablation - is the process of clearing away undesired material from a solid surface by irradiating it with a laser beam. By absorbing the energy of the laser beam, the targeted material is heated very quickly, making it evaporate or sublimate. As the surface

below does not absorb any energy, it remains untouched.

By manipulating the laser flux, its wavelength and its pulse length, the amount of material that is being removed by a single laser pulse can be controlled with extreme precision. Making laser cleaning equally suitable for rapid and deep rust removal as for removing only one thin layer of paint, without damaging the base coat. The patented software can make 2D-laser patterns, which provide a smoother cleaning result, and make operating the handheld machine easier compared to 1D laser cleaning.

https://www.youtube.com/watch?v=m4oMaxo3jlc

Full Description:

(Please provide complete answers to the questions below. Graphs, charts, and photos can be inserted to support the answers.)

1. What is the innovation?

The QF-Compact is a mobile laser cleaning system with a maximum output power of 100W. The system is the smallest in this category, making it easy to transport and carry around. On top of that, and with a weight of only 16 kg, it can be handled by just one person.

2. How does the innovation work?

By downsizing all internal components and by arranging them cleverly, P-Laser managed to create a system of this size and weight. Large electrical components were replaced by industrial graded PCB's, new material choices were made (plastic, carbon, lightweight aluminum,…) and components were fitted perfectly together to create an intuitive and easy to service design.

3. Describe the corrosion problem or technological gap that sparked the development of the innovation. How does the innovation improve upon existing methods/technologies to address this corrosion problem or provide a new solution to bridge the technology gap?

P-Laser created the QF-Compact to help operators when cleaning corroded surfaces. No matter how difficult the part is to reach, the QF-Compact will find a way to get it cleaned, without injuring (back problems) the operator during the process.

A lot of the products on the market today are large and heavy and will require extra tools (e.g. forklifts or winches) to move the system to the desired place. The QF-Compact can be taken with you, almost everywhere you go.

4. Has the innovation been tested in the laboratory or in the field? If so, please describe any tests or field demonstrations and the results that support the capability and feasibility of the innovation.

Today, more than 40 systems are sold all over the world, cleaning corrosion from molds, pipes, welds,… in different industries: process and production, heavy industry, aviation, military,…

5. How can the innovation be incorporated into existing corrosion prevention and control activities and how does it benefit the industry/industries it serves (i.e., does it provide a cost and/or time savings; improve an inspection, testing, or data collection process; help to extend the service life of assets or corrosion-control systems, etc.)?

The QF-Compact will clean corrosion and in many cases even prevent the surface from corroding (e.g. cleaning salt residue from metal components, will stop or slow down the corrosion). In use, the system will provide a cost and time saving solution, and will make it easier to perform non-destructive tests on hard to reach places.

6. Is the innovation commercially available? If yes, how long has it been utilized? If not, what is the next step in making the innovation commercially available? What are the challenges, if any, that may affect further development or use of this innovation and how could they be overcome?

Yes, system was introduced in January, 2019.

7. Are there any patents related to this work? If yes, please provide the patent title, number, and inventor.

(21) International Application Number:

PCT/IB2018/051747

(10) International Publication Number

WO 2018/167712 A1

Inventor: PHILIPPRON, Jean Claude Marie; 17, Begonialaan, 3550 Zolder (BE).

(54) Title: HANDHELD PULSED LASER DEVICE FOR CLEANING OR TREATING A SURFACE