IR LASER

laser cleaning

of wood, metal and polychromes

www.irlaser.pl

export@irlaser.pl

technology

The laser ablation method has been successfully used in many industries for years. Wherever non-invasiveness and precision count, lasers turned out to be the best alternative to traditional methods, the use of which often resulted in a number of undesirable consequences. It is therefore not surprising that they were also quickly applied in the conservation of works of art.

The first applications of the laser in the process of cleaning monuments concerned mainly small objects, such as sculptures or small elements made of metal. A major limitation that prevented the use of the laser in large-area operations was the technology of the time. It made lasers very delicate devices and could hardly leave conservation workshops. In addition, the working area was too small to effectively deal with, for example, an architectural detail, not to mention the entire facade.

In recent years, however, there have been a number of innovations that have allowed the creation of a fully mobile and definitely more efficient device. The introduction of new generation laser sources has made the device much more resistant to a harsh working environment, and the redesign of the optical system and the beam control algorithm have increased the working area several times.
Today, cleaning the entire facade is not only possible, but also often more profitable than in the case of traditional methods.

The devices that our company is equipped with have been designed especially for conservation of works of art. Made in Poland, using top-class European components, they guarantee safe and effective cleaning of most historic materials.

wood

Traditional methods of cleaning wooden historic objects are mainly associated with a complicated process that requires precision and requires the use of chemicals. Mechanical cleaning of intricately carved wooden elements always carries the risk of damaging the material, and the complicated form often prevents the tool from reaching concave parts. In the case of laser ablation, the layers and dirt evaporate completely without damaging the structure of the wood and at an incomparably faster pace. A properly adjusted beam removes most historically used polishes and, unlike chemical methods, does not leave any discoloration on the wood surface.

wood

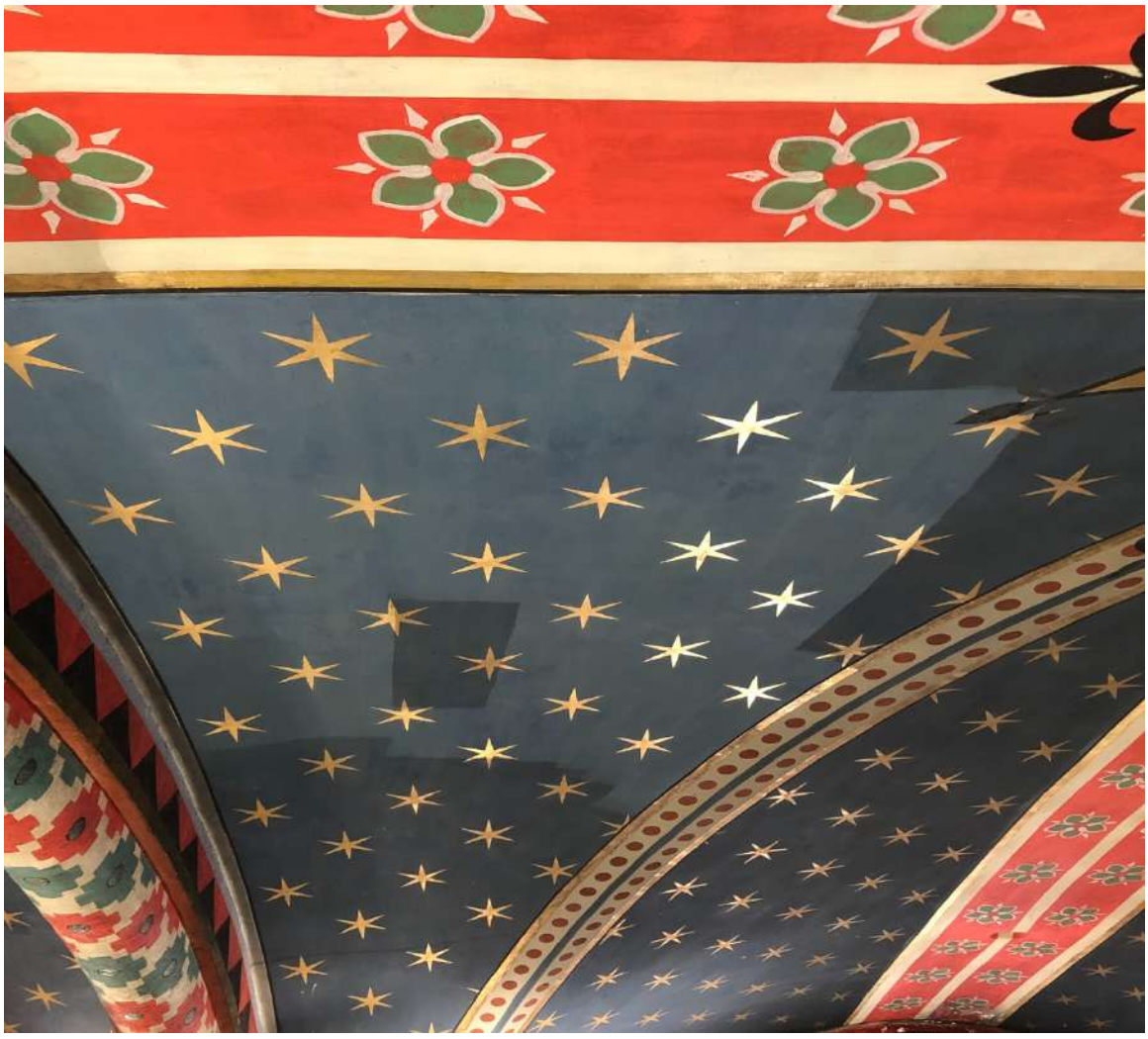
metal

Regardless of the composition of the alloy, thickness or age, a number of substances appear on the surface of metals over time, which effectively change their original appearance. In the case of massive elements, laser cleaning takes the form of a technical procedure during which both foreign deposits and oxidation products of the original layers are removed. Of course, some of them are the original patina, which, with proper adjustment of the laser parameters, remains in place. It happens, however, that due to the environment in which the object is located, compounds are formed on the surface, the presence of which in the long run is unfavorable for it and they must be removed. Laser ablation is also a safe method of cleaning very thin layers of metal, such as gilding.

metal

polychromes

The loss of cohesion and adhesion of the paint layer in wall decorations is a common phenomenon, but it implies a number of problems in the context of their cleaning. Often, before starting this procedure, it is necessary to fix the powdered paint layer, during which the dirt is also partially fixed. The laser effectively copes with dust deposits, stains after condensation and water infiltration, or strong accumulations of soot, without affecting the sensitive paint layer. It is a non-contact solution that allows cleaning without prior reinforcement.



polychromes

advantages

safety - laser ablation technology is the safest method of removing layers and it is approved where the use of chemicals and abrasive methods is impossible.

selectivity - the ability to remove individual layers of coatings without affecting the others. Depending on the requirements, we are able to control the thickness of the removed layer.

contactless - the cleaning medium is light energy, so there is no physical contact with the cleaned surface. It is particularly important in the case of delicate, corroded, detached materials or those with a characteristic, original carving.

chemical neutrality – no use of chemicals that have a negative impact on the durability of binders and pigments.

physical neutrality - eliminating the long-term effect of water and, consequently, the need for drying. Additionally, laser generates only a minimum dose of heat.

ecology - harmful substances originating from dirt deposits and emanating during the ablation process must be eliminated. The evaporated impurities or solid particles are absorbed by the suction with suitable filtration. Also only 230V power source is required.

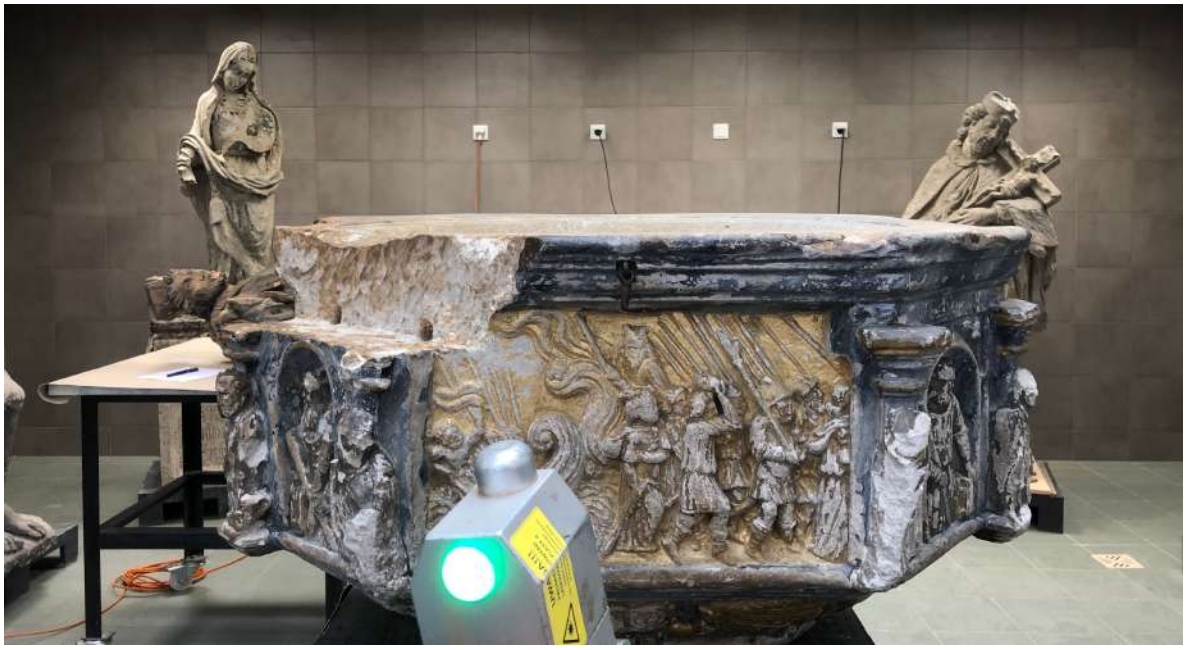
economy - the maximum efficiency of our lasers is even 15 m^2 per hour for one device. The object does not need to dry, the workplace does not require cleaning, and the surface usually does not require additional cleaning procedures.

professional approach

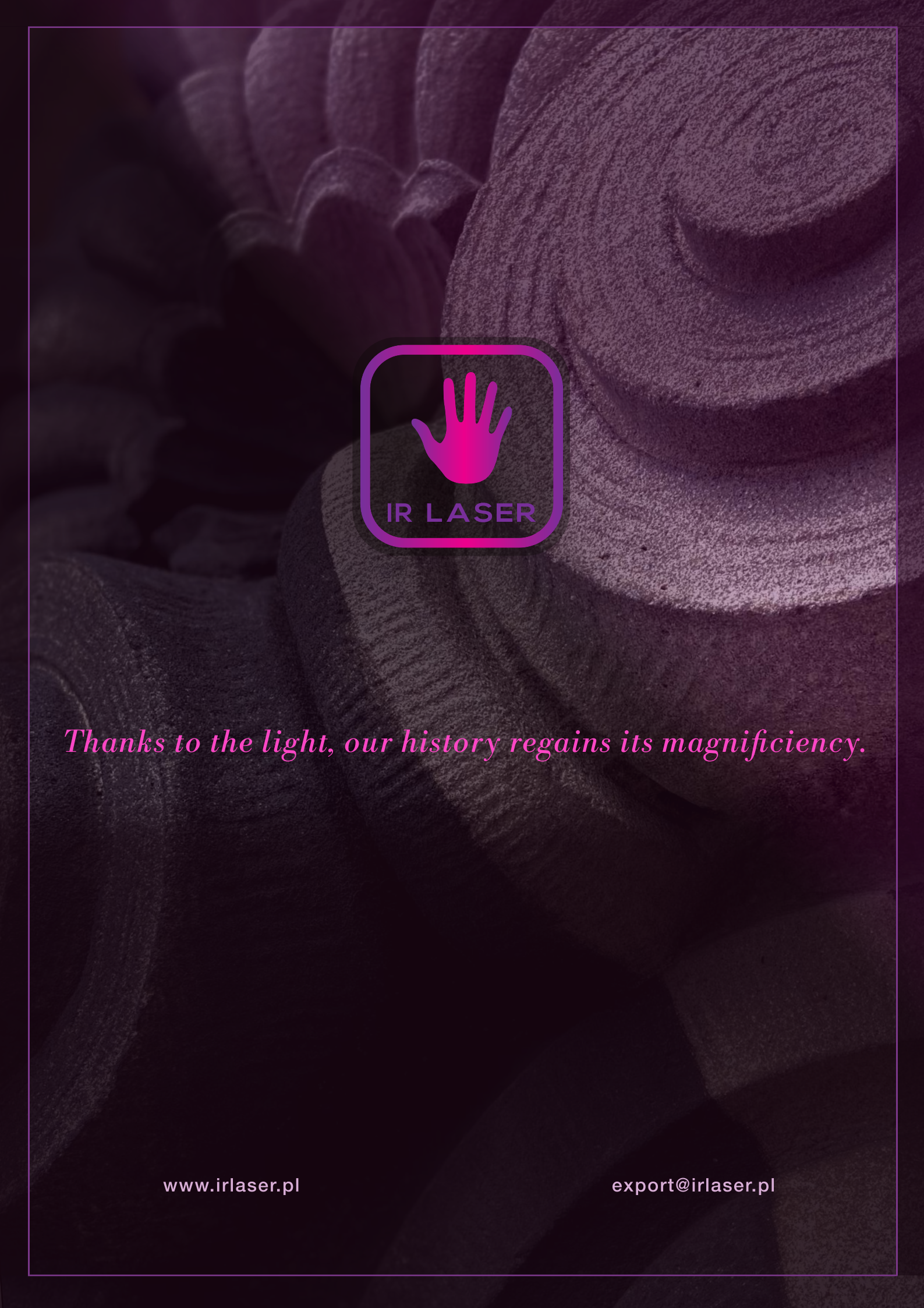
IR Laser exists and works for over 3 years. During this time, we have completed over 150 projects for clients and scientific institutions from 7 European countries. Our portfolio includes both small and complex sculptures, as well as several hundred-meter facades.

We have equipment and training to work in the toughest conditions:

- work in contaminated zones (e.g. lead)
- work at heights and in hard-to-reach places
- work in places not excluded from use (extraction and filter systems)



Our team consists of engineers, art conservators and operators with many years of experience in working on historic buildings. We constantly improve our competences by conducting scientific research, participating in conferences and working on the development of laser systems.



Thanks to the light, our history regains its magnificiency.

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