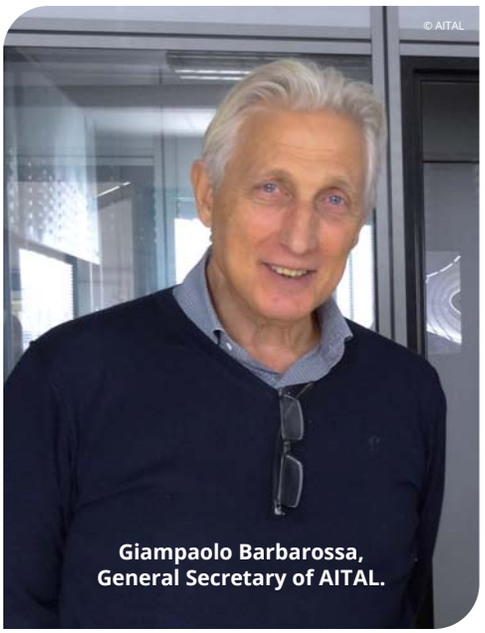
Aluminium, The Metal of the Future: AITAL's Point of View on This Ever-Developing Market

Interview with Giampaolo Barbarossa,
General Secretary of AITAL – Italian Association for Aluminium Surface Treatments

We have asked a few questions to AITAL General Secretary Giampaolo Barbarossa, in order to understand the trends in the aluminium surface treatment sector in this particular economic situation, characterised by a constantly evolving market. Interesting ideas have emerged that confirm the strategic role of the industry of aluminium and its finishes for both the Italian and international markets.



Giampaolo Barbarossa, General Secretary of AITAL.

In Europe, the aluminium industry and, as a consequence, its related surface treatment sector, have always been very dynamic. Can you give us an overview of the pre and post-pandemic situation?

When the Italian authorities started to talk about a possible lockdown, our association cooperated with CENTROAL (the Italian Association for the Aluminium Industry) to help the companies in the sector to keep operating, while observing safety rules. Unfortunately, we did not achieve this result, because the economic activities related to aluminium metallurgy and metal surface treatments were not included in the final version of the Prime Ministerial Decree, which only enabled the suppliers of essential services to continue operating, upon notice to the prefecture.

As is well known, the market of aluminium surface finishes is directly linked to the industries that use them. In particular, coating accounts for almost all finishes chosen in the construction sector, whereas for all other intended uses anodic oxidation accounts for slightly more than coating does. In 2019, the year before COVID-19, aluminium consumption in Italy had dropped by 2.2% compared to 2018, settling at just over 2,000,000 tonnes. Consequently, the turnover of the entire sector, including the surface finishing field, had also been reduced, divided between castings (34%), extrusions (19%), sheets (15%) and all the remaining segments.

In the first five months of the current year, in the sectors of extrusions and sheets, which are the types of semi-finished products that almost always require surface finishes, the COVID-19 emergency led to sharp reductions starting from March (included), as also shown by the data of German aluminium association GDA. The restart of aluminium production, and therefore of its related finishing activities, resulted in a recovery in terms of volumes, with the exception of the automotive sector, which still seems to be reflecting on the future of cars and on the strategies available to possibly switch from heat engines to electric ones. Only in the next autumn will it be possible to understand whether this growth trend will continue or the recent increase was mainly linked to previous orders.

The surface treatment sector is currently seeing interesting developments related to the antimicrobial protection of aluminium surfaces. What are the most important projects underway?

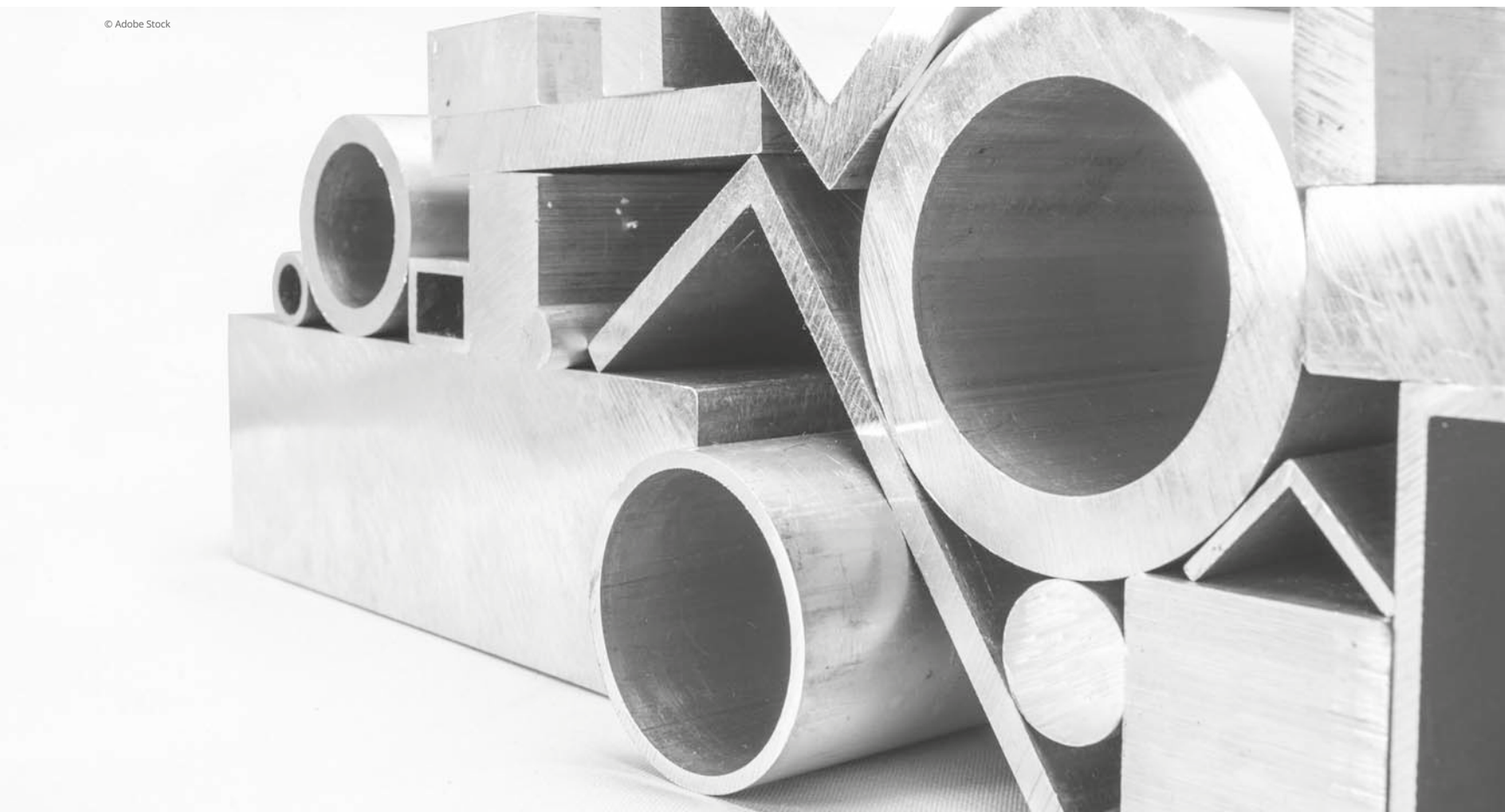
A distinction must be made between antimicrobial characteristics and surface properties affecting the persistence of viruses. In the case of the former, there are already established processes and products capable of reducing, in shorter or longer times, the quantity of bacteria that are present on certain surfaces for any reason. As concerns the latter, several studies have been conducted in the past to assess the persistence of Coronaviruses on metal surfaces, including aluminium. A major study conducted in the United States

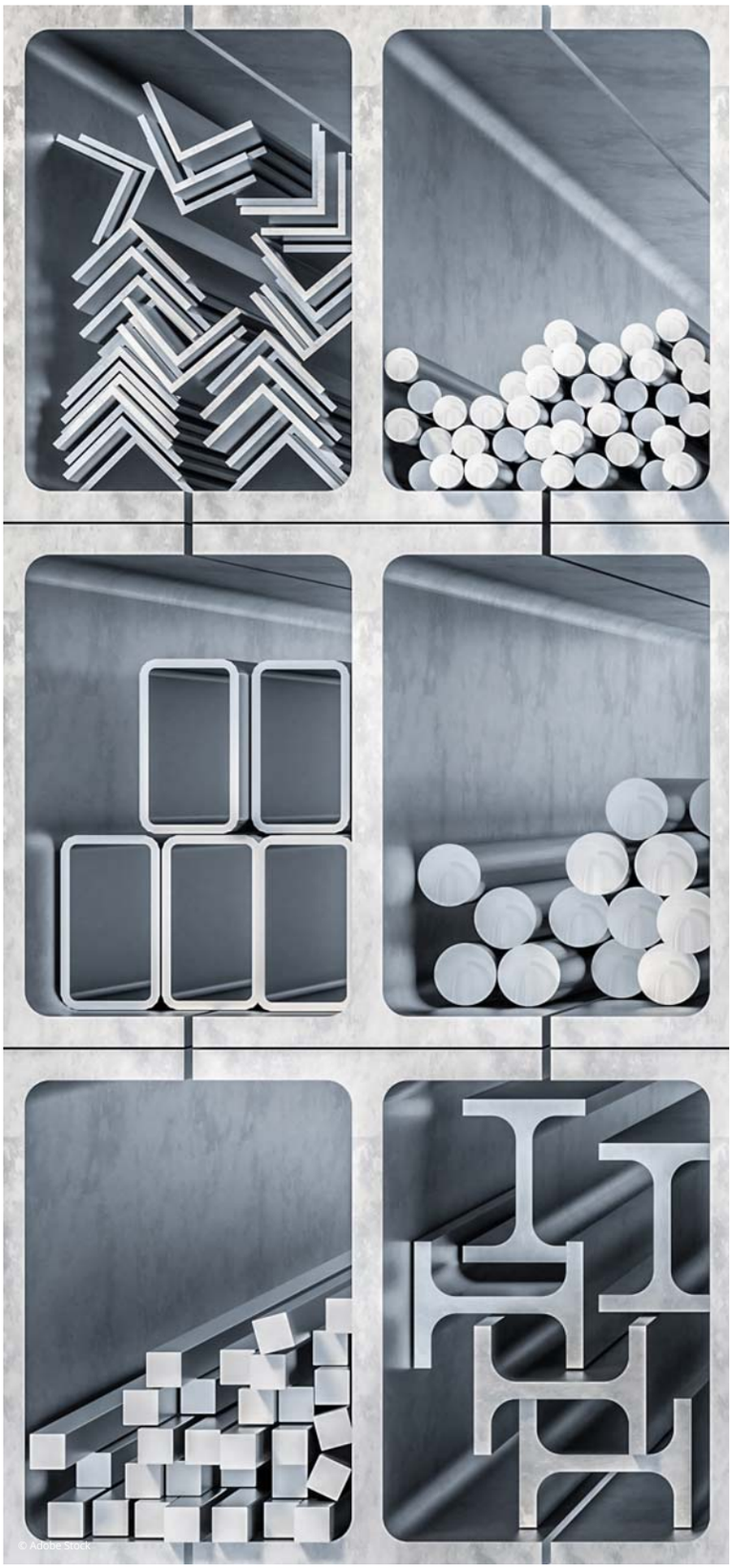
in 2000 found that the Coronavirus does not survive on aluminium surfaces after 2 to 8 hours from contact with its surface[1]. These results were confirmed by trials conducted on a larger scale in the early months of 2020. A comparison of these figures with those related to other materials shows the very high intrinsic efficacy of aluminium in terms of minimum persistence time of Coronaviruses on its surfaces.
In any case, the COVID-19 transmission potential assessed by these studies, that is, the risk of infection through contact with everyday objects, including aluminium objects, has been rated low to very low. In fact, the chance of infection transmission from a person to an object and then to another person is rather remote. Several specific events should occur at the same time, such as a sneeze or cough of an infected individual resulting in the deposition of viral material on a specific surface, which is then rubbed by the hand of another person, who touches their mucous membranes in their mouth, nose, or eyes with the same hand shortly after. According to numerous research laboratories, including FDA in the United States and the German Federal Institute for Risk Assessment, no transmission through this potential route has been confirmed so far.

[1] https://www.journalofhospitalinfection.com/article/S0195-6701(00)90795-3/pdf (21(09/2020)

A variety of widely available products have proved effective in cleaning and disinfecting surfaces, including aluminium ones, from the Coronavirus, such as soap and water, disinfectant wipes, and chemical spray solutions. The EPA agency has a list of disinfectants approved for their effectiveness in destroying the Coronavirus.
Of course, it is recommended to carry out preliminary cleaning/disinfection tests in small areas, in order to check that this operation does not change the aesthetic and functional characteristics of the surfaces to be treated.

What are the current priorities of the sector in general and, in particular, in terms of regulations?
Based on all the above-mentioned elements, the finishing sector does not seem to be particularly affected by the ongoing health emergency. In fact, I believe that there may be excellent job opportunities for companies that are already owners of processes and/or products capable of effectively fighting any type of virus or bacterium on surfaces. I refer in particular to fields already regulated in terms of materials, surfaces, and sanitation products, such as, for example, the hospital, pharmaceutical, and food sectors.





What is the position of your association with respect to the current market?

Our association has always been a strong supporter of quality products and a representative of companies that are fully compliant with the mandatory legislation on environmental, safety, and hygiene at work, as well as respectful of their employment contracts. We are devoted to innovation in a broad sense and we are lucky to be able to rely on Qualital (the Institute for the Industrial Certification of Aluminium and other Materials) in terms of support of professionals with great technical and scientific experience and of a state-of-the-art test laboratory (Qualital Servizi) for the characterisation of raw and finished aluminium.

In line with our vocation, at the Qualital Servizi lab we have conducted tests on the formation of a surface layer on aluminium containing silver ions, capable of providing the substrate with antimicrobial characteristics. This is not an actual anodising process, but the deposition of a very thin layer with a barrier effect, obtainable in a very short time. This antimicrobial feature could be of interest for several sectors producing semi-finished parts intended for the most varied industries: hospital, pharmaceutical, and food, but also door and window frames, furniture, and so on. This is why we are assessing the possibility to seek some partners among the producers of aluminium materials and components to carry out an industrialisation project.

More recently, driven by the new interest sparked by the COVID-19 pandemic in different aluminium applications in the hospital, pharmaceutical, and food sectors, we have involved several AITAL members specialising in aluminium anodic oxidation in some new projects. At a special video conference that we held on July 9th, we invited aluminium expert Lorenzetti, with a vast know-how on the corrosion phenomena affecting this metal, its surface treatments, and its bio-reactivity characteristics. During her speech, Lorenzetti presented an accurate overview on the current knowledge and the processes and products already used to make aluminium surface bacteria-free (which does not mean virus-free!), starting from an old Japanese patent on the formation of hard oxide layers containing silver ions.

Among the participants, there was also the representative of an AITAL member with experience in a particular anodic oxidation process that has reportedly proved effective in terms of antimicrobial characteristics. Based on the tests carried

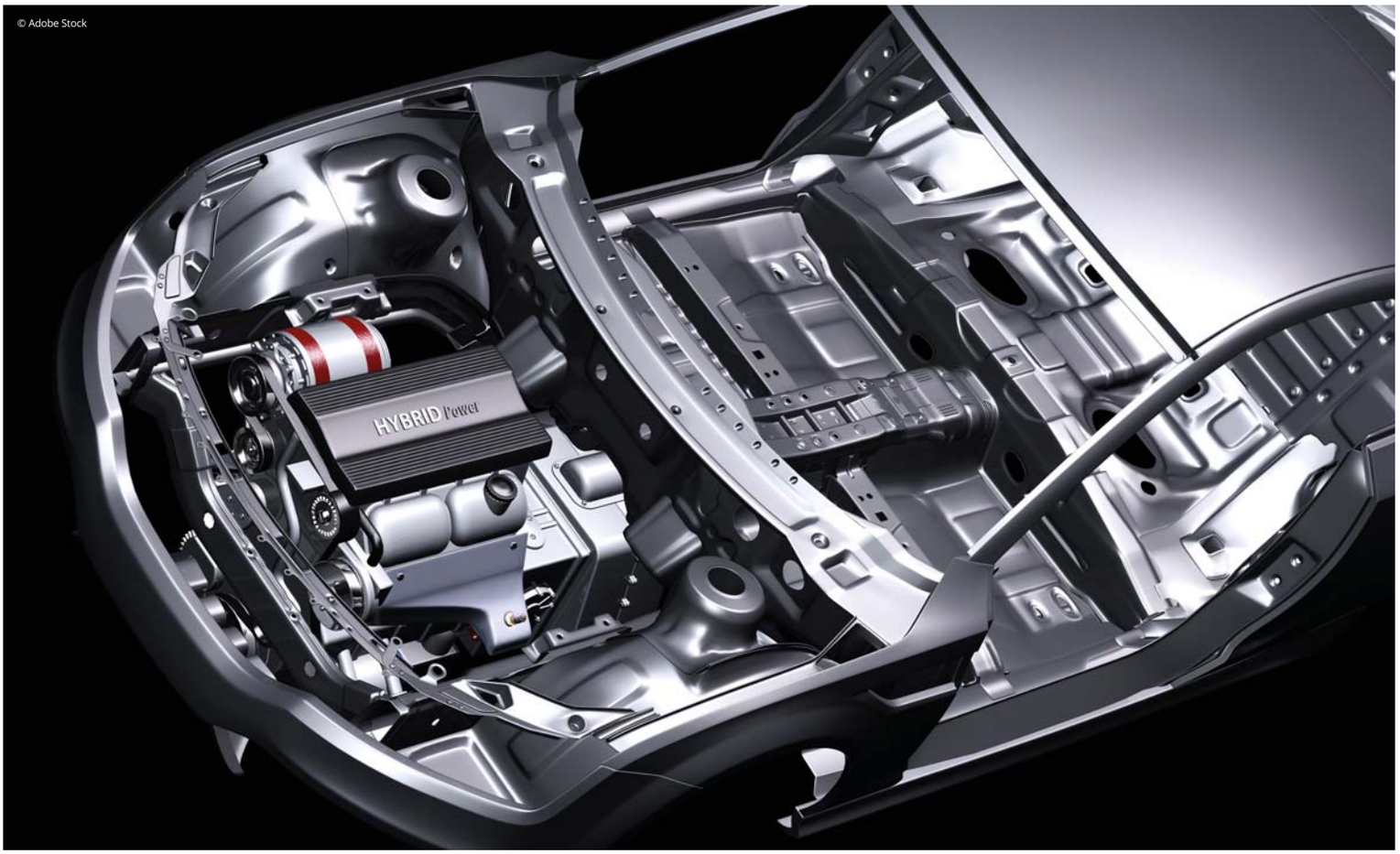
out by this company and on the observations of other members of the working group created to confirm their results, we will consider the need and/or usefulness of drawing up a guideline on these processes, on the assessment of their effectiveness over time, on the use of treated products, and on the cleaning operations required in order not to compromise the oxide layer's aesthetics, quality level, and, of course, antimicrobial efficacy.

The application of circular economy principles to the aluminium sector is a recurring topic. What future do you see for this particular approach?

It offers a further added value to this metal, as it is in line with its peculiar and universally recognised characteristics that make it optimal for a wide variety of applications. Aluminium is certainly a "circular" material *par excellence* because it is infinitely recyclable, after re-melting and transformation into new semi-finished products and/or products. It is worth emphasising that recycled aluminium is no different from that obtained from the original mineral (bauxite) and its fundamental characteristics always remain unchanged; on the other hand, the recycling of aluminium guarantees a saving of about 95% of the energy needed to produce it starting from the mineral.

At the moment, it is difficult to predict next year's economic trend. However, what future developments does your association expect, both in Italy and globally?

Our association, as well as all other associations operating in the aluminium industry, has always been committed to defending and promoting this metal and its characteristics: ductility, lightness, high electrical and thermal conductivity, malleability, and recyclability.
The main strength of our organisation is our ability to understand, defend, and promote every surface finishing process able to give high functional and aesthetic characteristics to metals. Together with other national and foreign associations, we look to the future with confidence, because we believe that aluminium has become and will remain irreplaceable in a variety of fields of use and that, in fact, it will be increasingly employed for ever-new intended uses.
In addition to the leading position it has held in the construction sector for several decades, I see strong growth in the use of



aluminium in fields where lightness will become a must-have characteristic. It will certainly gain even more market shares wherever it replaces steel, simply because aluminium will allow reducing weights by over 40% while maintaining the same mechanical performance levels. This property will lead to an increase in its consumption particularly in the transport sector.
Since the early decades of the 1900s, when the first aluminium aircraft fuselage was produced, the use of this metal has significantly expanded with beneficial effects also on energy saving and safety. Aluminium alloys improve aerodynamics and impact absorption capacity. All of this translates into a significant reduction in energy consumption. According to well-established estimates, thanks to its extreme lightness and strength, aluminium makes it possible to create lighter cars with reduced consumption: every 100 kg of weight reduction compared with steel, cast iron, and copper, it allows saving 1,500 litres of fuel over the service life of a car. Even more important results can be obtained by using aluminium for lorries and trailers: in these cases, the use of aluminium to replace traditional materials can lighten the vehicle by almost 1,500 kilos, thus reducing consumption and their dangerousness in the event of accidents. Other sectors in which aluminium and its alloys will be ever more present are shipbuilding and aeronautics.
Aluminium is also of particular importance in the packaging sector, especially for foods, and it will be even more so in the near future, especially in the face of the health emergency we are going through. For food and beverage packaging, aluminium is the only metal capable of being transformed into thin sheet, while maintaining good ductility and ensuring total opacity to ultraviolet rays, which cause rapid deterioration of food. It is totally airtight and, coupled with other materials, it is ideal for vacuum packaging; it is impermeable to fluids, gases, dust, and – speak of the devil – bacteria. Finally, going back to the issue of circular economy, the spread of fully recyclable cans contributes, and will increasingly do so, to the reduction of the pollution of our beloved, but so far a little mistreated, planet.