

PRESENTS

# COVID-19 Impact: Importance & Emergence of Industry 4.0

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Report on

# INDUSTRY 4.0

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**Debanjali Sengupta**  
Deputy Manager - Content, AlCircle Pte Ltd.

## Editorial

Dear Readers,

After 2019, which was an aftermath of tariff implementations, trade wars, price fluctuations, and demand sink, 2020 was a year of hope in the aluminium industry. But the emergence of COVID-19 during the last phase of 2019 and more prominently at the beginning of 2020 turned the year malaise so far. Besides disruptive impacts on the entire global economy, the COVID-19 outbreak has brought an unprecedented shock to the metal industry, including aluminium. Most of the businesses in the industry are either fighting their own battles of survival or struggling to continue their sustainable operations.

At this juncture, AlCircle presents its fifth quarterly e-Magazine on the topic **“Covid-19 Impact: Importance & Emergence of Industry 4.0”**, with an attempt to share responsible information and suggestion on how the implementation of Industry 4.0 technologies can help the industry bounce back through the COVID-19 pandemic.

Industry 4.0, which has already been a dominating topic of discussion in the metal industry, is now believed to be a game-changer during this pandemic. The term “Industry 4.0” is referred to as the digital transformation of

manufacturing/production and related industries and value creation processes. Cyber-physical systems form the basis of Industry 4.0, which are needed for smart factories where machines are augmented with wireless connectivity, sensors, and artificial intelligence and connected to a system that is able to make decision on its own.

With the use of a large-scale machine to machine communication (M2M), Industry 4.0 enables data transfer and management more efficiently, while increasing automation and improving communication and self-monitoring. Therefore, Industry 4.0 is believed to help businesses make quicker decisions and achieve higher productivity at a lesser time while working remotely during the continuing spread of the coronavirus.

In this e-Magazine, we have with us top industry leaders, some of whom are leading technology players that have already initiated digitalization in the industry by bringing in path-breaking technologies and some are smart companies who have been pro-active in deploying those technologies in their plants to drive growth during and after the COVID-19. They have shared their personal views and opinions on how Industry 4.0 technologies are benefitting the aluminium industry during the pandemic and what is expected in the post-COVID world.

So, now when Industry 4.0 has become almost an imperative feature in every business model to combat the COVID-19 impacts and emerge as a sustainable player in the near future, here is our small effort to share some relevant information and suggestion with you all.

Hope you have a great reading experience!

AlCircle Editorial Team:

Rupankar Majumder, Email: [rmajumder@alcircle.com](mailto:rmajumder@alcircle.com)

Debanjali Sengupta, Email: [dsengupta@alcircle.com](mailto:dsengupta@alcircle.com)

Heena Iqbal, Email: [hiqbal@alcircle.com](mailto:hiqbal@alcircle.com)

Design & Technical:

Sandip Paul, Email: [sandip@alcircle.com](mailto:sandip@alcircle.com)

Snehasish Sahoo, Email: [snehasish@alcircle.com](mailto:snehasish@alcircle.com)

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# Performance Dashboard: Previous AlCircle E-magazine



## E-magazine Performance Statistics: Aluminium LeaderSpeak 2020



Total Global Reach **33937**



Total Hits **139469**



Total Countries Reached **104**



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## Aluminium LeaderSpeak 2020 Participants





**Debanjali Sengupta**  
Deputy Manager - Content, AlCircle Pte Ltd.

## Industry 4.0: A key for surviving the COVID-19 Pandemic

Just when the Industry 4.0 was creating a buzz in the aluminium industry, inspiring smelters and plants to integrate digitalization in their operations management, the COVID-19, also known as the novel coronavirus, made its emergence on the earth causing a pandemic and slowing down lives and livelihoods. The virus has caused radical shifts in workflows all across the globe as millions are practising social distancing and/or complying with self-quarantine recommendations. But while downsizing many industries, the pandemic's dramatic appearance is believed to have accelerated numerous trends on the other hand, such as "Industry 4.0".

The term Industry 4.0 is used to describe the extensive use of digitalisation in an industrial environment. It covers the current systems and technologies for automation, artificial-intelligence and data exchange used in the manufacturing and industrial sector. It promotes a concept of factories in which machines are augmented with wireless connectivity, sensors, and artificial intelligence and connected to a system that is able to make decision on its own.

In other words, Industry 4.0 is the current transformation of traditional manufacturing and industrial practices into the latest smart technology, focusing on the use of a large-scale machine to machine communication (M2M) to enable

data transfer and management more efficiently and effectively. It increases automation and improves communication and self-monitoring, which are believed to help businesses achieve higher productivity at a lesser time.

## How can Industry 4.0 help businesses mitigate the COVID-19 impacts?

The COVID-19 pandemic has forced companies around the world to adjust their strategies to survive in the so-called “new normal.” While many businesses have experienced plunges in demand and growth, some are even struggling for survival. At this juncture, companies are taking in-depth looks at how Industry 4.0 tech could help them return to productive operations.

**Accelerate the virtual workplace:** By adopting the virtual workplace faster and using an integration platform to meld data from these systems, manufacturers can create granular, real-time views of their business and operations from anywhere. So, data flowing from supply chains will enable partners to identify trends as they emerge. This, in turn, will lead to quicker, better decisions about where to redeploy raw materials, shipments and personnel — such as scaling back plant operations in a virus hot zone while ramping them up in a recovering area.

**Deploy more IoT-enabled sensors and devices:** Internet of Things (IoT) adoption has been turning every device, and even components within a device, into a data creator over the past few years. Thorough application of sensor technology on the factory floor can eliminate blind spots, giving management or visualization systems a holistic view of operations that can be operated and monitored remotely. When the data from these sensors is integrated with business and engineering systems, then analyzed, these management systems can also predict an assembly line failure before it happens.

**Use VR/AR tools:** In order to operate at full production capacity while adhering to new social-distancing norms (which will likely drive a reduction in shop-floor headcount), manufacturers will have to speed their adoption of virtual reality and augmented reality (VR/AR). For example, consider a scenario in which only a third of the workforce is managing the factory floor, with the remaining two-thirds working remotely. In such a scenario, if drilling or milling equipment requires servicing or maintenance in the factory, the specialist on duty that day may use an AR headset or hologram to perform the work with virtual

support from remote specialists.

**Remote video monitoring:** Specialists at home can be alerted via video analytics and predictive IoT to review a process station and help diagnose issues or guide on-site repairs. The technology also could be used for remote visual inspections. The high capacity, speed and low latency of new 5G wireless networks will make it possible to stream video data to a local cloud endpoint for quick analysis.

## **Effect of COVID-19 on the Global Aluminium Industry**

With the COVID-19 outbreak having swept across the world, the aluminium industry has been witnessing some of the adverse effects. When not even a month or two went by this year, the aluminium industry started facing a brand new challenge in the form of COVID19. The London Metal Exchange spot price for aluminium, which was already stressed during the pre-covid time, fell further low below \$1440 per tonne in early May 2020.

The global aluminium demand in the end-user sector, especially in automotive and aerospace, started declining significantly, indicating a possible glut in inventory in the near-term. Hydro, in its Q2 results of 2020, noted that the global primary aluminium consumption dwindled by 9% over the year due to the coronavirus pandemic. The world consumption stood at 15.482 million tonnes in Q2 as compared to 17.01 million tonnes in Q2 2019. Hydro also warned a bleak demand in the rest of 2020, leading to a significant primary aluminium surplus. External sources are estimating a surplus of between 3 million tonnes and 4.7 million tonnes, with both China and the rest of the world in surplus.

For the entire year of 2020-21, the aluminium production is estimated to hover between 65 million tonnes (approx.) and 67 million tonnes (approx.), in contrast to the consumption ranging between 60 million tonnes and 62 million tonnes (approx.).

Owing to this downtrend demand for the metal, Japanese aluminium buyers agreed to pay \$79 per tonne of premium to a global producer for July to September shipments, the lowest since the December quarter in 2016. Japan is Asia's largest aluminium importer. The premium it agrees to pay each quarter for primary aluminium shipments over the London Metal Exchange (LME) benchmark cash price sets the pricing tone for the region.

A source at an aluminium producer said the coronavirus pandemic took a toll on Japan's aluminium industry, especially for use in automobiles. This, as a result, prompted buyers to seek lower premiums.

Chalco's aluminium sales in the first quarter of 2020 stood down by 9.5% from 950,000 tonnes in a year earlier to 860,000 tonnes, due to lower demand for the coronavirus outbreak, according to a datasheet for analysts reviewed by Reuters. But the output of aluminium stood at 950,000 tonnes, unchanged from last year as smelters kept rates high during the epidemic, lifting inventories.

Hindalco, as a measure to minimise its inventory build-up, is exporting more than 80% of the total output, mainly to countries like Korea, the USA, Malaysia, Brazil, and Japan. The demand from the Indian domestic market was down by 6% YoY to 3.72 million tonnes in FY20 and 11% in Q4.

### **Why Industry 4.0 in Aluminium Industry?**

Global aluminium producers are currently facing numerous challenges due to a volatile economy caused by the COVID-19 outbreak, environmental concerns, and stricter safety and carbon emission regulations. Besides, a strong increase in cyberattacks, a hike in the risks of operating blocks, and data loss are also being faced by some of the companies during the on-going pandemic. However, while external forces can not be controlled, the key rule to improve efficiency and productivity of a smelter lies in the intelligent use of data and information available within the smelter. This will improve cost, quality, and customer satisfaction while offering better protection against external factors. So, introducing digital technologies and other Industry 4.0 elements in a plant can be considered a need of an hour to enhance productivity with better control over production process and customer reach out. This, at the same time, will provide better safety and environmental sustainability.

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**Peter Vanvuchelen**  
Director Sales & Business Development, Hencon

## Leading by example: how to deal with climate change and ways to drive circular economy- By Peter Vanvuchelen, Director Sales & Business Development, Hencon

On a daily basis we are facing the dilemma typical for our kind of business: how can we increase our productivity, stay competitive and at the same time respect our planet and environment. How can we make our business more competitive and at the same time becoming sustainable and environmental friendly? How can we make this work in an aluminium smelter?

It was a few years ago that my daughter – at that time only 14 years old – told me extensively that my personal carbon footprint was not something to be proud of. Of course, I defended my behaviour, my professional activities and my travels all over the world as a way to contribute in a humble way to a world which was comforting our cherished way of life. In the end, who wants to pay 5.000 € for a battery in a mobile phone? We all want cars at an affordable price and we all want nice design stuff in our houses. I felt that I was delivering a battle with my teenager daughter which could only elicit some sarcastic reactions from her side.

No doubt, youngsters of today are reflecting very well the responsibility that we have towards future generations. To safeguard our planet is not just

a romantic ideal; the climate changes show us more than ever that it has become a necessity and our responsibility to have a critical look on our mindset.

In the middle of all these changes, listening to our customers (and my daughter.), and with the mission to build machines that are ready for the future, Hencon has been very active in developing technologies which comply already to standards that will be settled within the near future. I already talked you about our vacuum cleaners built for eliminating fine dust in aluminium plants and also our smart AGV's have been elaborated in several articles.

May be a little less remarkable, but largely developed throughout the last couple of years, is the electrification of our entire product range. Looking for ways to eliminating the problem of emissions and making our products more sustainable, we believe that electrification can be a good starting point for a 'green fleet'. Nearly all of our vehicles are already available with an electric drivetrain. Besides the obvious economic benefits and the substantially longer product life time, it is a clear ecological statement.

In the same philosophy, and taken in consideration the restrictions – in autonomy - of battery-charged vehicles, Hencon has started a project behind the scenes to equip our products with hydrogen cells. We believe that this can make a serious difference in terms of emission (exhaust is pure water) but also in terms of extending the range of our battery equipped vehicles. Being aware of the danger of water in a potline, it is clear that Hencon will not accept any risk. Please mind you that combustion engines push out probably more water (under the form of condensation) than a well-sealed hydrogen engine would ever do.

While talking about sustainability and circular economy, it might be relevant to mention that Hencon is actively supporting a refurbishment program. Hencon has a large experience in refurbishing vehicles. Born during the COVID-19 period, this program was a small step to relieve our customers from old machines that are not being used, while we can support at the same time other customers that need an affordable 'as new' machine. This brought us to the idea to set up a program in which we act as a trader / broker for second hand machines, completely updated to modern standards and flavoured to specific requirements, while offering the same warranties and quality as on a brand new vehicle. Besides the obvious ecological benefits, it also offers

opportunities if delivery time is an issue (ready in maximum 3 months) or the capital expenditure of a new machine is challenging.

Our world is changing, in every possible aspect, and Hencon wants to support actively their customers in this transition. Staying on top of all developments is the concern of all of our customers and we want to be your partner in that. Looking for better, more modern ways to keep and grow your business in a responsible way (both economically and sustainably) is our driver.

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**Adriana Torres**  
International Business  
Development Manager of GHI  
Smart Furnaces



**Pablo Fuentetaja**  
Business Development  
Director of GHI Smart  
Furnaces

## “Industry 4.0 has been a revolution in terms of modernizing the aluminium industry from the smallest up to the biggest players”- Adriana Torres, International Business Development Manager of GHI Smart Furnaces

GHI Smart Furnaces, S.L., is a family owned company with 80 years of history that designs and supplies industrial furnaces, auxiliary equipment and associated services for technical assistance and digitalization. The company is involved in the design and manufacture of industrial furnaces, turnkey plants, SAT and 4.0 digitization. The company has supplied more than 8,000 facilities, 1,400 exported to the international market.

The sectors GHI Smart Furnaces addresses are, among others, the iron and steel industry, the aluminium and copper industry, foundries, metal workshops, shipyards, aeronautical industry, heat treatment and hot stamping companies. Adriana Torres and Pablo Fuentetaja Business Development Managers of GHI Smart Furnaces, give an insight into the GHI’s latest strategies and projects that have helped companies upgrade to the Industry 4.0 and the future of Industry 4.0 in the aluminium industry post COVID-19 in the below interview:

**AlCircle: GHI Smart Furnaces is involved in the design and manufacture of industrial furnaces, turnkey plants, SAT and 4.0 digitization. Give us a heads up on how you are helping other companies implement digitization in their operations?**

**GHI:** GHI has always been a key player in the furnaces industry, with a huge market share in the aluminium and steel industry. We have been focused in our customers' needs to provide reliable equipment with cutting edge technologies and processes with a high degree of automation and flexibility. Innovation has been part of our DNA since GHI's beginning and that is why we have always introduced state-of-the-art technologies in our equipment. The equipment that we supply to our customers is the core of their production plants, and its performance can affect directly the financial result of their companies.

Our solutions are fully digitized to maximize the result of our clients. The 4.0 technologies developed by GHI and embedded in our equipment provide our clients with a total real-time control and visualization of their plant in terms of production and performance. Moreover, it allows them to improve their plant operation, hence reducing the cycle times, standardizing working procedures, making faster and easier the maintenance activities of the plant and increasing the uptime.

Among other benefits, these can be translated in power and fuel savings, man-hour savings, more productivity, reduction of emissions, safer plants, and optimization of plant layouts.

At GHI we assist our clients during the process of digitization of their plant and its integration into 4.0 industry with a scalable process. Analyse the client's objectives and processes is the first step, the second is sensorize the equipment, and the most important, is to evolve from data-driven insights to data-driven actions. All of these are possible thanks to the analysis of a huge amount of data that is gathered by advanced sensors from GHI equipment in the client's site which is processed by our specific developed software.

The digitization of the plant's operations provides the plant managers and client's decision makers with the proper feedback about what is happening in their plant and what should be done.

The technology developed by GHI is not only a software that shows figures in the screen, it is more, it gives total feedback and advice for a continuous improvement based on objective figures and the knowledge about process and equipment of both Client and GHI. That is why it goes beyond and we have called this solution “BEYOND 4.0 by GHI” .

**AlCircle: Do you think post-COVID-19 adoption of Industry 4.0 shall be further accelerated by companies in their business operations?**

**GHI:** In our view this unexpected situation is going to speed up the Industry 4.0 by two main reasons.

First is the competitiveness. Having a total control of the production process and product traceability will be fundamental to increase the competitiveness of the plants. Industry 4.0 technological pillars such as Big data, Artificial intelligence, IoT and cybersecurity will allow to reach higher levels of control, process efficiency and sustainability.

Our solutions are oriented to primary and secondary aluminium producers, and unfortunately this market, as many others, seems that is going to be hit by a decrease of demand due to the situation of the automotive and aeronautics industries. With a low price of aluminium and low demand, the companies will have to focus on being more efficient and competitive, improve the performance and reduce costs.

As previously explained our 4.0 Technology, with a real-time data capture and analysis, allows a full control of the plant with few people. The periodic feedback based on the KPIs of the plant, allows the improvement of productivity, reduce costs and increase the plant availability, hence the client becomes a more competitive company.

The second is the necessity of the remote control and automation of the plants. We are not talking about operating a plant from home, what could be possible in some degree, but the total control of the plant from a control room with few staff will be a must. It will reduce the manual operation of the equipment, minimize the human errors, automate the production and maintenance processes, and optimize working procedures, time, and production ratios. Consequently, plants will be more efficient and safer.

**AlCircle:** Based on your experience, how impactful do you think has the adoption of Industry 4.0 has been for companies in the aluminium industry?

**GHI:** It has been a revolution in terms of modernizing the aluminium industry from the smallest up to the biggest players and will continue evolving.

The digital transformation goes beyond process and product improvement, it reaches to an evolution of strategies and management decisions. Adoption of Industry 4.0 has meant an increase in the productivity and competitiveness of companies in the aluminium industry to expand their market share. It also has helped companies to ensure sustainable production processes and enrich their plant safety.

The digitization, automation and IoT are nowadays more affordable for anyone for a global improvement. Industry 4.0 allows companies to achieve an optimization of the performance and production ratios, the reduction of costs, the control of emissions, the safety at work and the standardization of any operative aspect of the companies.

The companies are able to focus in the added value of their products instead of attending any corrective aspect of their daily production activities.

**AlCircle:** Brief us on some of the latest strategies and projects that have helped companies upgrade to the Industry 4.0

**GHI:** One of the most relevant projects is at an aluminium recycling plant in Europe. The customer had an intensive control over the consumption and the melting rate but did not know which were the different parameters that had a major impact on these variables. Although the expertise gave them some insights, they could not ensure the exact values as the opinions and knowledge vary from one operator to another.

With the integration of the 4.0 technology, including advanced sensorization, a specific developed platform for Bigdata analysis, and the expertise of GHI, we were able to upgrade and digitize their process and develop custom-made algorithms. This upgrade gave the customer the precise and exact information on which parameters of the equipment were the most important to optimize

the overall process, even helping us to integrate a higher automatization on the furnaces. The customer can visualize all this value-added information in real time. Today, the customer can control the different phases in a melting cycle of their TRFs while increasing the process control, and minimize the process variability between shifts and operators, among other benefits. The upgrade to Industry 4.0 is beyond sensorizing and capturing data, the knowledge on the process and equipment plays a very important role, this help us to perform the corresponding analysis and provide to our customers added-value information.

Another example is the upgrade to the Industry 4.0 of an aluminum die casting plant. The close relationship with the customer, the commitment and openness to share information is key for a successful project. In this case, we analyzed their process carefully and understood their fears and expectations. After capturing the relevant data, we developed machine learning algorithms to optimize the production process. The objective was to give the users improvement suggestions related to the operation of the furnaces and equipment in terms of process control, energy savings and productivity. Having a controlled process implied modifying the skimming process and change the temperature setpoints, among other activities. All these recommendations are given to ensure the optimal performance of the furnace and the overall process. Also, the upgrade to industry 4.0 has helped companies to ensure the top performance of the equipment during all of its lifecycle.



**AlCircle: How effective you think does adoption of Industry 4.0 become in terms of achieving enhanced efficiency and productivity?**

**GHI:** It is going to be fully effective, since the producers will have the real-time value-added data to make decisions immediately, and the tools to optimize their operations attending to their production needs, having a 360° view of the business, production ratios, lead times, consumptions, overall and partial equipment performances, safety and environmental aspects.

This information is already there, at their plant, they just need a solution like Beyond 4.0 by GHI, and the proper technological sensors to gather the appropriate data and translate into a common language for people that allow them to make the proper decisions.

At GHI, we design and supply smart furnaces and auxiliary equipment. In our experience, these have represented for our clients a complete control of their production process and reach higher levels of efficiency and productivity. The complete control of the production process and the capability of anticipating any stop has allowed us respond quickly and on time, thus increasing the up-time of the equipment. For our clients, one of the main advantages has been to identify the process deviations to implement actions plants and standardize the processes that result also, in higher productivity. With standard processes there is no room for errors or unexpected downtimes.

**AlCircle: How can Industry 4.0 help the metal industry to overcome challenges in its refineries?**

**GHI:** Nowadays the aluminium recycling industry must focus on several key aspects.

First, optimizing the plant performance. Among other factors, this means optimizing the metal yield by reducing the metal losses in each melting cycle. This can be achieved with the proper equipment and plant layout. Hereby, providing the plant with flexible and adequate plant equipment with 4.0 technologies, designed based on the available raw material and required final products, and ensuring a high performance of the overall plant effectiveness and few and short maintenance stops.

Second reducing the overall production costs. The optimization of the fuel and energy consumption can only be identified with real and objective data from the plant performance. This is possible with the 4.0 technologies, based on a proper data capture system and a powerful software which can focus on the specific KPIs of an aluminium plant.

Third is automation. Together with the other challenges such performance and cost, the plant automation will improve not only the production rates, but it will enhance the safety at work and sustainability. This will allow the standardization of operations and avoiding undesired operation mistakes and control any aspect of the plant such the control of emissions.

GHI provides every client with a tailor-made solution focused on all of these premises to overcome the challenges imposed by the market. Our cutting-edge Smart furnaces and auxiliary equipment with high performance ratios embedding 4.0 Technologies, and along with our technical and process advice during the plant definition process, GHI is the best partner for the aluminium producers.

### **AlCircle: How do you see the future of Industry 4.0 in the aluminium industry post COVID-19?**

**GHI:** The COVID-19 issue is going to be an inflexion point. The market is going to demand more effective and technological companies in the aluminium industries to overcome the market constraint.

The aluminium producers will have to pay attention to the product features instead of being solving the daily production problems of the plant. They have to focus on adding more value and quality to their products and reduce the costs. This way be the only way to allow the companies to be more competitive in the market, and GHI proposes as a potential partner for those that are interested in this challenging modernization of the market.



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**Sofiane Haddad**  
Digital services – Fives Aluminium division

## **Fives' digital innovations to support the aluminium industry- By Sofiane Haddad, Digital services – Fives Aluminium division.**

Despite the lockdown situation, travel restrictions and various government policies in response to the COVID-19 situation, Aluminium producers have to carry out their activities, while following strict health protocols. In response to this unprecedented situation and thanks to our well-rounded worldwide organization, Fives' Services teams are breaking new ground to continue supporting clients operations.

At the beginning of lockdown, our teams first used the digital tools they were familiar with, in order to answer clients' requests without requiring any physical action. Then, capitalizing on our global presence, Fives' experts designed dedicated digital solutions to ensure the continuity and quality of services. Constantly in touch, our Front-offices teams located all around the world, close to the customers' sites, and the Back-office support teams in France are working together to provide peace of mind to our clients!

As an example in Bahrain, Fives Services Gulf, with the support of Fives experts from France, organized remote technical expertise in less than one week.

The experts' principal duty was to inspect an ECL Furnace Tending Assembly installed on-site. This intervention was challenging in many ways, but quite fruitful and demonstrated the ability of the Fives' teams to develop innovative solutions based on digital technologies. In Asia, Fives experts have logged-on via a web interface in order to be able to remotely monitor the process parameters of the recently commissioned Firing Control System. After some adjustments, they could follow in real-time the evolution of the parameters on the local operators' screen, allowing them to supervise the process performance of the production.

In Norway, a Fives expert provided the client with remote process assistance to optimize the operation of a recently commissioned Green Anode Plant. In China, a Fives technician went to the site to operate a filter repair work at customer's Green Anode Plant. The operation was prepared and supervised remotely successfully by an expert from France.

These assignments are part of Fives' commitment to support clients even more closely by using remote assistance solutions and thus ensuring optimum aluminium production everywhere.

At Fives, we are now firmly convinced that remote assistance will be more used in the future. In this health crisis situation, we were obliged to quickly change our ways of supporting clients, which allowed us to understand how powerful and efficient remote assistance solutions can be. Knowing that digital technologies are available almost all over the world, it must, therefore, be our task to exploit and promote to a greater extent the potential of these tools to support aluminium production. Not only allowing us to enhance our reactivity and availability while following social distancing, these tools also help us to assert ourselves as a major player in environmental commitments in the post-COVID-19 world, by minimizing as much as possible the flow of people around the world.

This period clearly showed that remote assistance is a relevant way to provide OEM expertise to clients. Now we accelerate the development of a full range of Remote services to increase our flexibility in a constantly evolving sector. Our vision is that Remote Assistance constitutes the next generation of services, for which Fives is ready to mobilize a comprehensive set of technologies and experts. Far



beyond the simple use of devices like AR lenses, it is about the ability to deliver value to floor-operations, which comes with secured IT technologies on one hand (remote accesses to networks, equipment, dedicated devices...) and on another hand, with the provision of expertise, through a global network of experts and their access to relevant information.

Our new brand, Fives Remote Services, has for raison d'être to position Fives as a reliable key services partner combining expertise and operational excellence to provide the optimal service delivery. Among these services, we propose e-learning and webinars to keep operators skills at the best level through various Fives training modules, remote training in simulator allowing operators to evolve



in a virtual & personalized environment to get the most out of your assets, remote solutions enabling with connected devices to get access to an OEM expertise anywhere at any time. We have also developed OEM-customer match-making tools such as Fives Connect, our brand new services portal that invites our customers to a smooth journey through a single online platform, privileged access to numerous digital services. Not only offering to each client its own secured interface, Fives Connect manages our brand new interactive and personalized bill of the material display, allowing maintenance teams to find relevant information, anywhere at any time. Fives' SMARTCrane, another Fives Connect function, allows monitoring the process cranes fleet performance in real-time, through remote data visualization. By providing access to critical incidents to anticipate maintenance operations Fives is now shifting from reactive support to pro-active assistance.

In addition to this brand new range of services, Fives can also help its customers to optimize their costs through process optimization solutions, requiring little CAPEX. We have developed several digital tools allowing our clients, with our support, to optimize their process and equipment operation to result in lower operating costs.

They include advanced measurement tools for anode production performance monitoring such as the new ECL Smart on the Fly Inspection and Analysis (SOFIA) system, measuring the process parameters of conveyed butts in the Anode Rodding Shop (Volume/Shape, Distance/Diameter, Colour, etc.), or the

ECL™ Instantaneous Measurement of the Anode Electrical Resistance (MIREA) system, a new solution to improve the anode production quality.

These tools are part of the Fives comprehensive approach to monitor and optimize Process and Equipment throughout the whole anode life cycle: the AMELIOS suite.

Featuring technologies such as the Binder optimizer (fine PSD Monitoring & Control) to improve the anode quality, Vision-based identification and inspection systems to get a digital signature of the anode while visually reproducing it, the AMELIOS Suite manages a number of functions dedicated to raw, baked and consumed anodes (Flue wall monitoring, rod & stub analyser..). By collecting all the Anode data from traditional Level 1 & Level 2 systems, including properties from our other sensors (MIREA, SOFIA, etc.), the AMELIOS Suite constitutes an ultimate solution for a fully-digital carbon chain.

Alongside environment, The Industry 4.0 was already one of the Fives' main concerns, it is now fully integrated as our new way of working. Connectivity added to proximity!



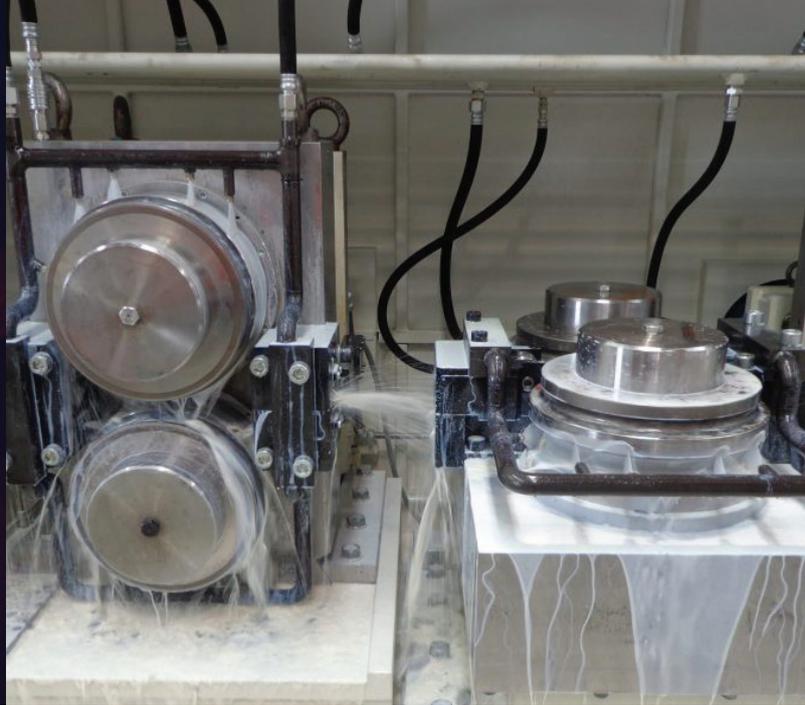


Report on

# Global Aluminium Industry – Key Trends to 2030



For any queries regarding AlCircle Report on Global Aluminium - Key Trends to 2030 you may get in touch with us at [booking@alcircle.com](mailto:booking@alcircle.com)



**Alberto Ghisetti**  
Sales Director, Continuus-Properzi

**“The impact of Covid-19 has mainly accelerated the innovative solutions, based mainly on the diffusion of new connecting technology that was already defined by Continuus-Properzi for the future” - Alberto Ghisetti, Sales Director, Continuus-Properzi**

Alberto Ghisetti is graduated in Mechanical Engineering with a specialization in industrial automation & robotics and has completed an executive master in Project Management. In the last fifteen years, he has matured experience in the international sale of complete plants in the non-ferrous, mine and steel industry. He is working at Continuus-Properzi for ten years, actually, as Sales Director, focused in both aluminium and copper plants for rod and ingots production.

Alberto Ghisetti, Sales Director of Continuus-Properzi shares his insights in an interview with AlCircle concerning COVID-19 impact to the industry:

## **AlCircle: Can you briefly introduce your Company?**

**Mr Alberto:** Continuus-Properzi, the leading expert in the aluminium and copper wire rod continuous casting industry, invented the continuous casting & rolling process for nonferrous rod production and today is the global leader of CCR lines for Copper and Aluminium rod, including all necessary elements from furnaces to casting and rolling equipment, to coiler. Our product line also encompasses machinery for the production of nonferrous ingots with the Track & Belt system, the Continuous Rotary Extrusion System (Pro-Form), and our latest disruptive innovation, the production of the self-annealed copper wire using the dedicated MICROROLLING® mill without an annealing step.

## **AlCircle: Has Covid-19 influenced your business?**

**Mr Alberto:** The current epidemic has affected almost all businesses in every corner of the world. Italy was one of the first countries outside China to be exposed to this situation. After a first tough moment, we were able to organize our work in order to reduce its impact to a minimum and the activities in our factory have not been delayed. Today we have completely recovered all the critical situations and we are delivering our equipment as scheduled. The main impact is limited to the commissioning of our plants under installation due to the travel restrictions in some countries.

## **AlCircle: How is your company approaching this main impact of Covid-19 in your business?**

**Mr Alberto:** We have immediately identified the tremendous improvement in technology as the solution to this problem and others. For this purpose, we have immediately decided to accelerate the improvement already designed and tested in recent years.

## **AlCircle: Can you provide an example of your solution to reduce the effect of Covid-19?**

**Mr Alberto:** From many aspects, the heart of a new Plant's life cycle is most likely the Commissioning. In order to overcome the travel restrictions with some countries, we have defined a more effective, quicker, and less expensive method to perform the commissioning through the utilization and fruitful application of new technologies. We have called it "e-Commissioning" and it is a great solution for the current situation as well as an important improvement for the future.

The “e-Commissioning” consists of an innovative way to proceed with commissioning services which essentially:

- decreases the overall commissioning duration and costs, eliminating travel times and at least a significant portion of Continuous-Properzi supervisors presence on-site,
- exploits the diffusion of new connecting technology by means of large Internet band for assistance purposes,
- expands, deepens and makes more concrete the operational and maintenance skills achieved by the Customer’s staff.

The principle is extremely simple: the Continuous-Properzi commissioning team, working remotely from headquarters, in real-time and in an almost continuous mode, supports, leads and supervises the activities of the Customer’s personnel on-site.

The means and the methods adopted are such as to achieve a practically equivalent result, or perhaps even better, to that which is possible having the Continuous-Properzi team present on site.

Except for the execution of the hot test with the metal, this is particularly advantageous and recommended in all the first phases of the commissioning, from the erection to the cold test’s completion.

If you are interested to better understand how the e-Commissioning is in practice, we invite you to contact us and we will be glad to provide more details.

The Smart e-Commissioning will be able to offer a service to our Customer’s personnel that is practically at the same level as if the Continuous-Properzi staff was physically present on-site but with the great advantage of having provided very detailed training.

Indeed the effectiveness of this training leads to an acceleration of the Customer’s staff towards autonomy in managing the new Line, from both the operational and maintenance perspectives.

Furthermore, this type of commissioning is more flexible since it can be suspended (if required) and resumed without incurring any travel expenses for personnel demobilization/mobilization.

This new way to support our customer during the Commissioning, combined with our traditional Commissioning with the presence of our Expert(s) on-site, is the natural evolution of our I4.0 program, named IULIUS 4.0, and will provide us with the flexibility to overcome any possible present and future restrictions. We are very optimistic about the future and for our e-Commissioning program. Not only do we expect it to be an additional tool for us, but it is also a guarantee for our customer to successfully complete the project even during the worst, most restrictive conditions such as a global pandemic.

## **AlCircle: Do you have other remote solutions for your Customer?**

**Mr Alberto:** Starting from last year, as a natural continuance of the IULIUS 4.0 program, Continuus-Properti introduced its Customers to the possibility of having a wide range of support via remote methods.

The main services include Remote Technical Assistance and Written Consultancy for Engineering support or problem solving.

The Written Consultancy is a fast “problem solving” approach based on information exchange via e-mail after the commissioning of the Line. The Customer will detail the issue, clarifying in which specific cases it occurs and adding any meaningful pictures or additional information. Continuus-Properti will deploy its dedicated and qualified engineering/process team until problem resolution.

The Remote Technical Assistance is remote collaboration/assistance aimed at finding the solution of any possible operational or technological problem. It will be supplied upon request from Continuus-Properti headquarters by our Technical Assistance Staff in the shortest possible time frame.

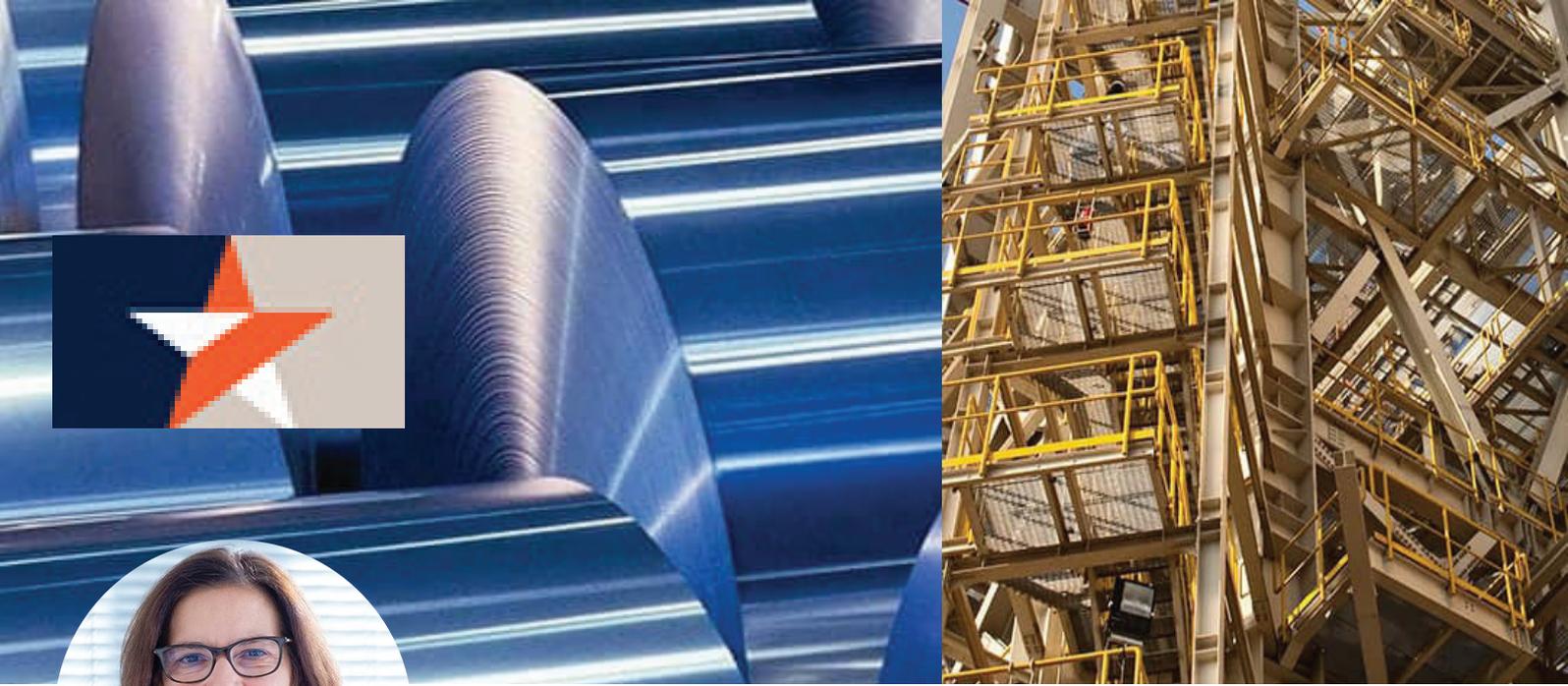
The above-proposed solutions can solve a wide range of problems that may be experienced by our Customers and, in a case where it is not possible to solve the problem with one of the above methods, our Consultancy service also includes the possibility for an on-site Technical audit at the project site.

## **AlCircle: What do you recommend to your customer for the future?**

Our suggestion is to immediately start a schedule to implement our IULIUS 4.0 program and our Remote Technical Assistance that, with a small investment, makes our support easier, faster and cheaper for our customers while providing huge benefits in terms of efficiency and operational costs savings. Both solutions are not only surpassing all the limitations due to Covid-19 but represent a very important opportunity for the present, the future, and even during normal working conditions.

The impact of Covid-19 has mainly accelerated the innovative solutions, based mainly on the diffusion of new connecting technology that was already defined by Continuus-Properzi for the future. All of the above solutions have been defined and most of them already presented in the months before the Covid-19 explosion, thereby, in a certain way, anticipating the future.

Today we continue to work on new ideas for our customers to improve our equipment and services to surpass any new challenges. Continuus-Properzi never stops thinking of new ways to better serve our customers. For example, we are glad to inform the readers that during the Covid-19 pandemic we have finished our completely new website ([www.properzi.com](http://www.properzi.com)) that has been launched only a few weeks ago.



**Paola Angelilli**  
ICT Executive Manager of Danieli group

## COVID 19 experience – How to be more resilient with a Cyber Security path – By Paola Angelilli, ICT Executive Manager of Danieli group

Covid-19 shows that the world is at great risk of disruption by pandemics, cyberattacks or environmental tipping points.

In addition, during this emergency period, we detected a strong increase in cyber attacks, an increase in the risks of operating blocks and data loss for the companies.

### How to be prepared to face these new challenges?

Danieli, one of the major plant makers on steel and nonferrous metal industries, has the pleasure to share with you our security strategies in the matter of the **Cyber security** in the metal industry.

Our approach to cybersecurity, based on the result of our internal “BeSafe” program, is to help our customers to be a step ahead, thanks to our “lightweight” approach to this issue, currently at the top of the risks for a **Metal Company**.

# REDUCE PRODUCTIVITY LOSSES

**MITIGATE  
CYBER  
SECURITY  
RISKS**

**IMPROVE  
GOOD/SECURE  
BEHAVIOURS**

**INCREASE  
AWARENESS  
ON CYBER  
SECURITY**

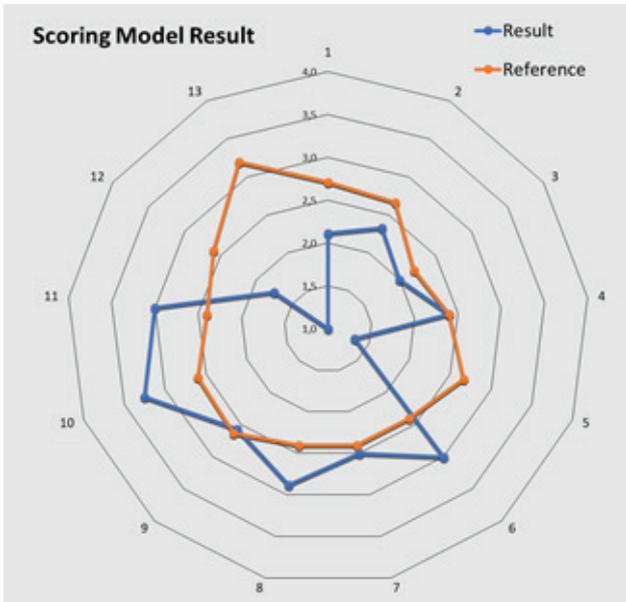
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KNOWLEDGE  
AND  
INTELLECTUAL  
PROPERTY**

if you want to participate in our path, we only ask you for half a day of your time to complete an assessment together, nothing more.

Here a real case of metal industry customer.

The analysis is covering both the OT and IT aspects, including the architecture ecosystem, the procedure, people awareness and crisis management.

MEASURE CATEGORY
1 - Information System Security Governance & Risk Management
2 - Ecosystem Mapping
3 - IT Security Administration
4 - IT Security Architecture
5 - Identity and Access Management
6 - IT Security Maintenance
7 - Physical and Environmental Security
8 - OT Security Architecture
9 - OT Security Administration
10 - Detection
11 - Computer Security Incident Management
12 - Continuity of Operations
13 - Crisis Management



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**Miles Prosser**  
Secretary-General of the International Aluminium Institute

## **“Industry 4.0 now directly impacts all the process and manufacturing sectors” - Miles Prosser, Secretary-General of the International Aluminium Institute**

Miles Prosser is the Secretary-General of the International Aluminium Institute (IAI), the only body that represents the aluminium industry at the global level. With more than twenty years’ experience working on various industrial policy issues, Miles brings in-depth knowledge on resource allocation, sustainability and climate change.

Miles joined the IAI from the Australian Aluminium Council where he served as Executive Director for more than 10 years. He leads the IAI to promote the unique and valuable properties of aluminium in sustainable development. He holds an honours degree from the Australian National University.

Miles Prosser, Secretary-General of the International Aluminium Institute speaks to AlCircle:

**AlCircle: Currently, IAI membership represents over 60% of global bauxite, alumina and aluminium production. Could you please share your views on the emergence and importance of Industry 4.0?**

**Mr Miles Prosser:** Digital technologies are everywhere, affecting the way we live, work, travel and play. Digitalisation is helping improve the safety, productivity, accessibility and sustainability of systems and industries around the world. If adopted well, digital technologies have the potential to deliver exceptional value to various aspects of our lives.

From technologies that help companies locate deposits, to autonomous equipment and fatigue monitoring systems that protect workers, to social media that keeps the industry in close contact with various stakeholders, digitalisation can be a force for good in our industry.

We are already using technology to improve the safety, productivity, accessibility and sustainability of our operations. We're finding new ways to use industrial waste in other applications such as in cement and concrete. We can now monitor and improve bauxite residue management. And I see this become the trend – where technology will enable the industry further its existing sustainability credentials.

Companies are also investing in new facilities fitted with state-of-the-art technologies which will enable automated monitoring and system controls with increased vertical integration along the supply chain.

Digital tools continue to transform ways in which customers buy and share their experiences in the aluminium industry. Digital channels like websites, blogs, and social platforms can be used for the buying process and to gather customer feedback. Using technology to analyse customer feedback enables companies in our industry to understand customer expectations, assist in acquiring and retaining customers and predicting and making suggestions for the consumer's future needs.

However, as an industry, we are yet to realise the full potential of Industry 4.0. Like all sectors, the aluminium industry is on a journey and continues to invest in technologies that will improve efficiencies all round.

Digitalisation of the industry over the next decade will be a major feature in the entire value chain.

**AlCircle: Do you think post-COVID-19 adoption of Industry 4.0 shall be further accelerated by companies in their business operations?**

**Mr Miles Prosser:** In as much as nothing is certain in this pandemic, I'm sure that the next 10 years will be very different to the last and technology will increasingly be central to the industry's recovery. From remote yet connected workforces to more digitalised processes along the chain, the pandemic is forcing people and business around the world to rethink their working and business models. In an industry where travel is seen as key, the virus has been disruptive but in the same vein has presented us with an opportunity to rethink our operations. In response to travel bans and social distancing requirements to stop the spread of the virus, we have all turned more to technology to give us a sense of normality or something close to it. Throughout this pandemic, our industry has continued to operate – thanks to Industry 4.0 for enabling distancing and contact control throughout the production processes. So what has COVID-19 changed in our industry? We've seen an increase in:

- conferences and trade events going virtual
- demand for increased digital marketing and communications
- sales and procurements being done online,
- virtual board meetings, staff training, team calls, and management meetings

With the success of remote operations during this pandemic, companies will find it hard not to transform the way they do business. Digitisation is here to stay.

**AlCircle:** Based on your experience, how impactful do you think has the adoption of Industry 4.0 been for companies associated with the aluminium industry?

**Mr Miles Prosser:** From using virtual and augmented reality to empowering field and remote workers in real-time, new technology has had a positive impact on the way the industry operates. The industry is leveraging algorithms and artificial intelligence to process data from across the value chain in order to make real-time decisions and to project future opportunities, but the largest benefit is yet to come. When adopted well, technology can help companies in our industry to become more responsive and resilient to challenges.

**AlCircle:** How do you integrate Industry 4.0 in terms of production of low carbon aluminium?

**Mr Miles Prosser:** Digital technologies can play an important role in enabling improvements and measurements of sustainability performances in our industry. At its optimum, digitalisation in the aluminium industry should enable seamless trading of information on the supply chain and help accountability on the industry's carbon footprint.

New processes that significantly reduce emissions and improve energy efficiency and high-performance machines and robots will enhance the materials and energy consumptions throughout the production process.

Industry 4.0 now directly impacts all the process and manufacturing sectors. Fully integrated systems are expected to help industries such as ours to increase production efficiency and further improve our sustainability credentials. The adoption of specific technologies can help accurately measure and document the industry's low-carbon and sustainable production footprints.

**AlCircle:** Do you think the adoption of Industry 4.0 has helped the aluminium smelters and plants enhance their productivity and efficiency?

**Mr Miles Prosser:** Many aluminium smelters are still operated manually but with technology, these processes can become more automated. Capturing, processing, and analysing digital data can allow better forecasting of

process behaviour as well as smarter, easier, and faster decision making. Digitisation allows errors and defects to be easily traced back and eliminated. This can lead to more efficient production. Some areas where digitisation can be applied include:

- Automatic pouring of hot molten in the furnaces – using an automated process or system will improve the process and make it more efficient.
- Remote-controlled robots can perform critical measurements during the smelting process in the furnaces, helping to prevent people from being put in unsafe situations.

## **AlCircle: How do you see the future of Industry 4.0 in the aluminium industry post-COVID-19?**

**Mr Miles Prosser:** People and devices are also becoming connected in ever-increasing numbers. More than 4.5 billion people, more than half the global population, now use the internet. Nearly 60% of households now have internet access at home, according to Statista.

Aluminium as a metal is an enabler of this rapid digitalisation. The metal is used in many digital gadgets that keep the world connected. I see aluminium playing an ever-increasing central role in the success of this digital era. From electric cars to new mobile technology, aluminium will be enabling all of us to move and connect. Accelerated digitalisation means a more collaborative industry, global in its outlook and approach.

The application of digital technologies will allow the implementation of new processes along the entire value chain, from manufacturing and sales to services and these will, in turn, build links between customers and suppliers. As we all know, digitalisation is not simply a transfer from analogue to digital systems but rather, networking between the business processes, the creation of efficient and integrated systems. This means, if adopted well, digitalisation can provide the needed data to enable effective management of the entire supply chain

In order to achieve a successful implementation of Industry 4.0, we will need to invest in research and development (R&D) to help us choose appropriate systems to enable us realise the full potential of this new era.

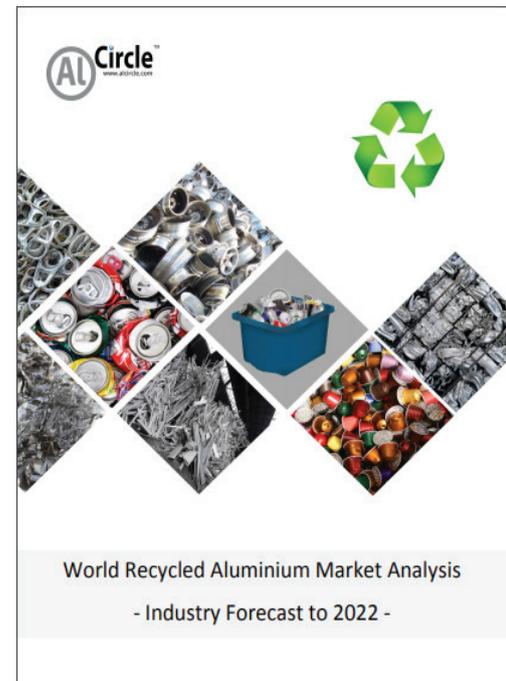
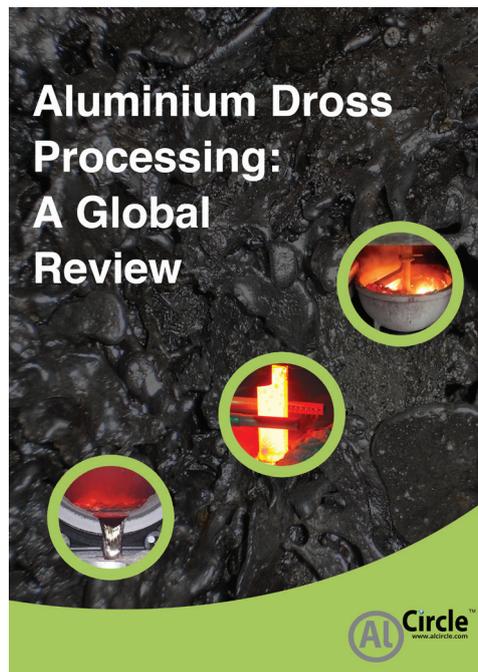
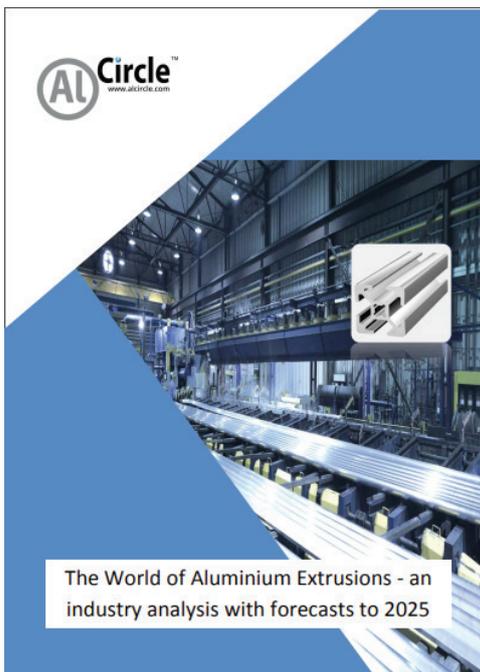
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**THINK ALUMINIUM, THINK ALCIRCLE**



## **Peter Unwin**

**AMETEK Land and AMETEK Surface Vision's Global Industry Manager – Metals**

**“Before the pandemic, we saw the need for connectivity and moved into Industry 4.0” - Peter Unwin, AMETEK Land and AMETEK Surface Vision's Global Industry Manager – Metals**

Peter is a chartered mechanical engineer and long serving member of the Institute of Mechanical Engineers (IMechE). He has worked in the metals industry for over 30 years during which time he has gained a broad knowledge of the production of steel and aluminium from smelting through to finished products. He has spent the majority of his time leading technical sales teams and developing close customer relationships globally in the flat metals sector specialising in equipment for casting and rolling steel and aluminium strip products.

Here, we have Mr Unwin with us sharing some of his views on the importance on Industry 4.0 during the on-going COVID-19 pandemic. In his view, Industry 4.0 facilitates you to access accurate data at any point in time and from anywhere, which is exactly a need of the hour now to make quick and remote decision. To know more, read his brief interview below.

## **AlCircle: Please brief us your views on the importance of Industry 4.0 during this on-going COVID-19 pandemic**

**Mr Unwin:** In my view, during this on-going pandemic, industry as a whole depends on getting accurate data from systems and providing this to management within companies to enable them to make data-driven decisions. Industry 4.0 facilitates this by allowing for decisions to be made quickly and remotely.

This has been emphasised by the pandemic in industries such as textiles and aluminium which are particularly in demand at the moment – they are operating in a very fast turnaround situation e.g. producing PPE. Systems need to be in place to solve problems fast and allow them to transform their processes to respond quickly to changes in demand.

It has been a proving ground for Industry 4.0 during this period for a lot of companies, with many businesses having seen the benefits. However, for AMETEK Land and Surface Vision, being in the instrumentation industry, it has simply been a continuation on a theme that we have been working on for many years. We have found that many companies have the data but do not know how to manage and use to their advantage; this is where we come in.

Our technology is capable of generating masses of data, for example video files, but this is useless unless you know what to do with it and simply uses up computer space. Our experts and engineers can understand the processes and systems of a company, and use our expertise to refine, tailor and fine tune the technology to deliver the most useful information.

At LAND and Surface Vision, we spend a lot of time working out problems and providing solutions. For example, we are working with a steel manufacturer to provide a solution to look into furnaces and provide temperature displays in video format. Our systems tailor this information and provide customers with specific information that is important to them.

LAND is focusing on reheat furnace applications in the steel industry where we can transfer our experience gained in the glass industry using our range of thermal imaging borescopes to provide live thermal images of conditions inside the furnace. By measuring product temperature within the furnace

accurately, we can produce increased efficiencies by ensuring the furnace is not operating too hot and expending too much energy, and also to reduce emissions. This is backed up by monitoring flue gases to ensure greenhouse gas emissions are minimised.

Some reheat furnaces have been running for over 40 years with the original operating system, with only a couple of people who are able to manage it. In addition to displaying accurate product temperature, thermal imager borescopes can provide details on individual burner combustion performance and allow remote live refractory inspection. AMETEK Land and Surface Vision have both been challenged during this period. Historically, our services such as servicing, support and maintenance take place on site. The pandemic has meant we have fast-forwarded our plans to expand our service provision to offer more remote services.

Continuous remote monitoring using live information is more appealing to people in this pandemic as it means no contact needed, especially important when sites and locations are on complete lockdown. It is also faster (no travel or waiting time) as data can be checked almost immediately.

Because of this, there appears to be more of an acceptance for OEMs to move to remote monitoring as a solution both now, during the pandemic, and beyond.

**AlCircle: Do you think wide adoption of Industry 4.0 in business operations would be a good solution to fight against the catastrophe of COVID-19?**

**Mr Unwin:** It is fairly simple for a lot of people. The pandemic has changed the way that people work, with a significant move to home-working unless it is business critical. It has been proved that many companies can operate just as efficiently working from home or remotely from the office or site.

Some manufacturers, including ourselves, have looked at what technologies we have and how we can adapt them for immediate demands. So, for us, it has been VIRALERT 3. We are experts in the field of industrial non-contact temperature measurement systems and have been able to develop our existing systems for human body temperature screening (VIRALERT 3) because we already had the systems, processes, technologies and expertise in place.

**AlCircle: How are you integrating Industry 4.0 into technology solutions that you provide to your clients during the COVID-19?**

**Mr Unwin:** New product development and improvement has always been a priority for us. Before the pandemic, we saw the need for connectivity and moved into Industry 4.0. The pandemic has pushed this along and we are now integrating Industry 4.0 into all of our products and ensuring they are compatible with all systems.

It is not a case of one single solution; there are all kinds of ways that people want to connect to devices. So, we are ensuring all our products are connectable to any form of digital communication (and analogue).

This means we do not have to get up close to devices – as long as there is an internet connection, we can access performance information and data.

**AlCircle: How do you think Industry 4.0 will change business models and the future of the metals industry post COVID-19?**

**Mr Unwin:** Businesses appear to be slowly getting back to normal operation levels where possible. Processes will have to be more resilient and be able to cope with demand (both up and down), which will likely change while we go through the transition of back to work.

As an example, metal process working in a high-volume sector will have seen a change in demand. With people uncertain of the future, the demand for new cars has reduced significantly. Automotive steel manufacturers run high-volume production continuously producing thousands of tonnes of high strength steel.

These processes tend to be quite stable and just change-monitored. As we go through this pandemic phase, we will likely see the automotive demand slow to pick up, but other sectors might emerge quicker.

Cold mills and galvanizing lines that were set up for automotive markets will probably become more versatile and respond to where the demand comes, e.g. appliances. The appliance market is typically small batch/volume so the automotive lines will need to change and adapt to this demand quickly. This

changing landscape will require more control, faster feedback to enable quicker production changes, utilising existing lines, equipment, and resources, and is done through digitalisation.

Artificial Intelligence is another factor in changing business models and Industry 4.0. It allows for faster response through digitalisation. We are now in a situation where we can develop and let machines learn from feedback from the data, so this will be evermore important as we come out of the COVID-19 pandemic.



**Dr Alexeis Garcia-Perez**  
Associate Professor in Cyber Security Management, Coventry University

**“The COVID-19 pandemic has reinforced the relevance of Industry 4.0 as an essential strategic component of manufacturing” - Dr Alexeis Garcia-Perez, Associate Professor in Cyber Security Management, Coventry University**

Dr Alexeis Garcia-Perez is an Associate Professor in Cyber Security Management at Coventry University (UK) and a Visiting Research Scholar at Georgetown University (USA). His original background in Computer Science was complemented by a PhD in Information Systems from Cranfield University, enabling an interdisciplinary perspective of Business Information Systems practice and research. Alexeis leads the ‘Data, Organisations and Society’ research team at Coventry University’s Research Centre for Business in Society. He works with a range of organisations from the public and private sectors, helping them shape the policy and practices that support the digital transformation of businesses and society.

Here, we have him with us sharing his insights into how the Industry 4.0 is gradually creating its space and relevance in the manufacturing sector during the COVID-19 pandemic and how it is turning into an indispensable component for all the industrial sectors to combat the on-going production and operational crises.

## **AlCircle: Could you please share your views on the emergence and importance of Industry 4.0?**

**Dr Perez:** Industry 4.0 is a term used to describe the current trend of automation and data exchange in manufacturing technologies. There are different views of the concept: some experts refer to it as the introduction of intelligent automation, while others have a wider perspective of the concept, describing it as the overall digitisation of the factory and its entire supply chain.

In general, Industry 4.0 is about the combination of cyber-physical systems and the recent advances in information technologies, particularly the so-called big data infrastructures which include the Internet of Things, Cloud Computing, Artificial Intelligence, Data Analytics, and more, opening opportunities for the manufacturing sector to do more, and do it better and faster.

The use of cyber-physical production systems within the factory in itself leads to improved productivity and efficiency, enabling flexibility in how the manufacturing organisation works. When combined with those new information technologies, the concept of a smart factory emerges. The whole workflow becomes driven by the digital view of the product and by machine-to-machine communication. New forms of collaboration and decentralised control are then possible, leading to more flexible, cost effective work practices and significant changes in customer delivery.

In terms of the adoption of its principles, although most organisations in the manufacturing sector are now aware, there is still significant work to do in order for manufacturers to understand what Industry 4.0 means in practice and how to maximise the opportunities it provides while dealing with the challenges of its adoption.

## **AlCircle: Do you think wide adoption of Industry 4.0 in business operations would be a good solution to fight against the catastrophe of COVID-19?**

**Dr Perez:** An accelerated process of adopting the latest technologies and their applications in manufacturing would be a significant development in the recovery from the current crisis.

Realistically, revolutionising the manufacturing sector is a complex process and we should not expect to see new Industry 4.0 initiatives leading to immediate improvements in productivity and efficiency.

However, as countries start their recovery from the COVID-19 pandemic, working towards implementation of the principles of Industry 4.0 would indeed offer the manufacturing sector a strategic direction and immediate benefits. For example, efforts across the sector to establish new networks and faster collaborations between SMEs and businesses of all sizes and particularly with research and development institutions would drive economic recovery while establishing the foundations for Industry 4.0. Governments' efforts to provide the foundations for implementation of Industry 4.0 (e.g. improved broadband infrastructure, new legal frameworks for cybersecurity, support for SMEs in their efforts to update the required management skills and existing technology infrastructures) would result in the creation of new jobs, supporting the recovery from the COVID-19 pandemic.

### **AlCircle: How do you see the future of Industry 4.0 post COVID-19?**

**Dr Perez:** The COVID-19 pandemic has reinforced the relevance of Industry 4.0 as an essential strategic component of manufacturing.

The pandemic has had a major impact on the sector and its operations across the world. In addition to a reduced demand for industrial products as a result of slowed economic activity, many manufacturing jobs had to be put on hold as these could not be carried out remotely. These conditions have led many manufacturing organisations to start thinking proactively in their approach to managing future crises.

An increase in the use of cyber-physical production systems and the deployment of those automation technologies mentioned earlier could help, for example, reduce employees density in specific manufacturing operations for those companies vulnerable to a virus outbreak. For others, adoption of the latest technologies could inform decisions concerning globalisation strategies, as improvements in communication within international supply chains and new principles such as digital fabrication allow for the implementation of tomorrow's innovative solutions.

## **AlCircle: How impactful do you think has been the Industry 4.0 during COVID-19 crisis?**

**Dr Perez:** Companies that had already adopted or had been involved in Industry 4.0 initiatives are likely to have been better prepared to navigate the COVID-19 crisis. From the remote operation of parts of a manufacturing plant to the use of technologies such as drones for monitoring the manufacturing processes, there are several examples of the impact of Industry 4.0 during the pandemic. In particular, we have seen how different manufacturers have been able to use their technologies to safely produce the equipment that has enabled key services such as healthcare to continue to be delivered throughout the pandemic.

## **AlCircle: Do you think the adoption of Industry 4.0 will accelerate post-COVID-19?**

**Dr Perez:** Yes, the more we learn about the COVID-19 pandemic, the more likely the manufacturing sector is to work to accelerate the adoption of Industry 4.0. One key lesson from the COVID-19 crisis is the need for society and businesses of all types to be proactive in their approach to managing all sorts of crises. The process of adopting the latest technologies and their applications in manufacturing helps not only rebuild the world economy of today but also build more resilient societies and economies for the future. Industry 4.0 helps build the platform for both faster recovery and improved resilience.

## **AlCircle: How do you think Industry 4.0 will change the business models post COVID-19?**

**Dr Perez:** As digital transformation becomes a reality across the manufacturing sector, new data-driven business models will necessarily emerge to allow for monetisation of not only the manufacturing products and services but also the relevant datasets and the insights extracted from data.

Decentralised and individualised production cycles, new internet-based services, and more connections between the technologies embedded in production systems and smart production processes will radically transform value chains. This will create the need for new business models that consider the concept of a smart factory and its closer interaction with customers and a more responsive value chain as they tailor their own business models.



**Éloïse Harvey**  
President of Mecfor

**“The unfortunate pandemic that we are facing is a catalyst for the Industry 4.0” - Éloïse Harvey, B. Eng. & Mgmt, President of Mecfor**

Éloïse Harvey is president of Mecfor, a Quebec-based company that supplies and manufactures specialized equipment for heavy industry, primary aluminium smelters and secondary plants, mining, rail and nuclear. Éloïse Harvey has been working for the heavy industry (with a strong focus on the aluminium sector) since 1999 holding various positions related to sales, marketing and business development for MECFOR and today she is president for Mecfor.

We are glad to get an opportunity to interview Ms Harvey to know her individual insights into the Industry 4.0, especially in light of the COVID-19 pandemic. She thinks implementation of new technologies in the aluminium industry does change the dynamic that exists between equipment manufacturers and aluminium producers. She says COVID-19 has forced companies to revisit their operations and has brought more awareness of applied technologies in the day-to-day.

To know more about her views and thought, here is an excerpt from the interview:

**AlCircle:** Being a manufacturer of state-of-the-art equipment, designed particularly for aiding each operational sector of the aluminium industry to easily track its respective operations, could you please share your views on the emergence and importance of Industry 4.0?

**Ms Harvey:** The industrial sectors as we know them are grappling with increasingly demanding production and profitability imperatives. Industry 4.0 is the buzzword that identifies the trend of integrating technology into equipment to enhance efficiency, reliability, and constancy in operations.

For sure, implementation of new technologies in the aluminium industry does change the dynamic that exists between equipment manufacturers and aluminium producers, some presenting more risk and uncertainties at first. The challenge is trying to push new technology in an industry that is a bit risk adverse and doing so in time where capital expenditure is at its lowest due to the overall world economic situation and when LME price is down. Suppliers will have to find ways to convince smelters that it is an investment and not an expense and demonstrate a ROI. Proving quick ROI is not always easy to do with new technology since the ROI is usually theoretical and not proven yet.

That being said, at all level, Industry 4.0 will have an impact on how tasks are being achieved and the way we are doing business.

**AlCircle:** Do you think post-COVID-19 adoption of Industry 4.0 shall be further accelerated by companies in their business operations?

**Ms Harvey:** The unfortunate pandemic that we are facing is a catalyst for the Industry 4.0. Glancing back few years ago, industries would have had hard time to cope with this brutal stop of activities. Thanks to technologies and applications, businesses were able to stay connected and adapt 'work-from-home' model from centralized 'head office' operations.

This unprecedented situation has brought us to realized that we can work differently integrating technology into our practices. So, yes, COVID-19 has forced

companies to revisit their operations and has brought more awareness of applied technologies in the day-to-day.

We expect that this pandemic should accelerate the process towards replacing the workforce with technology whenever possible as stay at home edicts and other sanitary orders could have a major impact on production.

**AlCircle: Based on your experience, how impactful do you think has the adoption of Industry 4.0 been for companies associated with the aluminium industry?**

**Ms Harvey:** At our level, this question is a bit hard to answer. We can only present assumptions and observations, but working on a project called 'Casthouse equipment of the future' we feel that visiting an aluminium smelter today and the same smelter 5 to 10 years from now would be like looking at black and white historical pictures from the very beginning of this industry. We trust that the evolution or Industry 4.0 revolution will give place to the best practices from metal flow management to handling of finish products.

**AlCircle: How do you integrate Industry 4.0 into your equipment designing and making for the aluminium sector?**

**Ms Harvey:** Just as an example, we are seeing an increase of demand in remote monitoring of equipment like telemetry and Casthouse Smart tools using Mecfor's QuickConnect Casthouse solution for tending, skimming and charging of furnaces. There is also the automatization with more robots integrated to solution. Nowadays, Mecfor is getting many requests for information on its Descaling Robot Arm for the Alumina industry. We are glad to see that technologies not only have impact on productivity, but also on workers' safety.

**AlCircle: Do you think the adoption of Industry 4.0 has helped the aluminium smelters and plants enhance their productivity and efficiency?**

**Ms Harvey:** In this journey, there will be quick wins and long run changes; definitely, Industry 4.0 is a game changer.

We are still at the early stage of the implementation of 4.0 technologies in

smelters therefore it is difficult to say that it has had an impact today but every step in the right direction is bringing our clients, the smelters, towards greater efficiency over time. Mecfor is glad to be part of this wave of change.

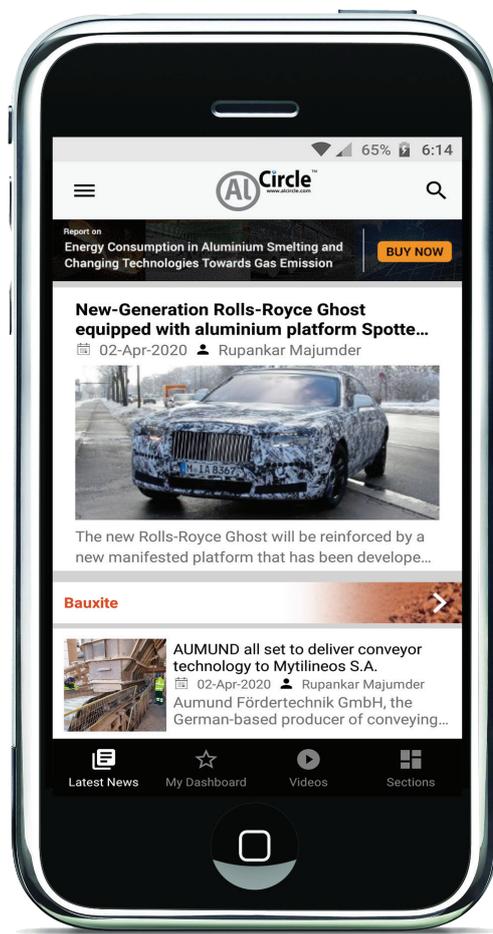
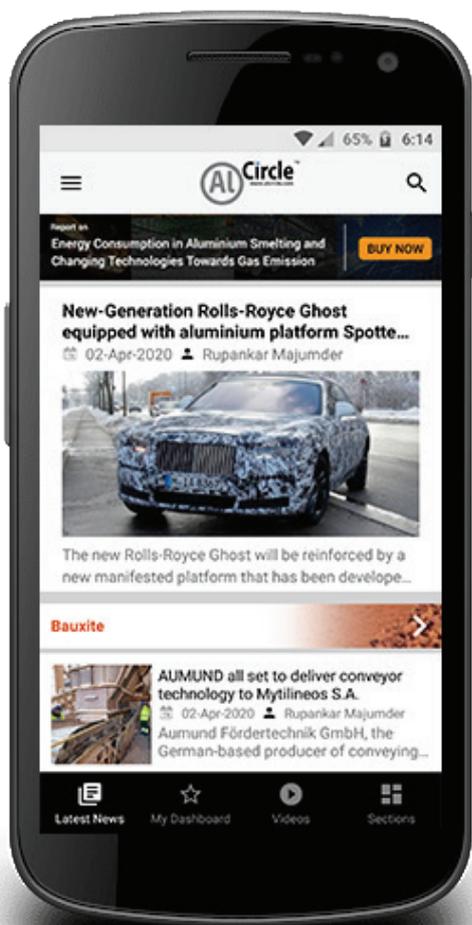
## **AlCircle: How do you see the future of Industry 4.0 in the aluminium industry post COVID-19?**

**Ms Harvey:** All Western smelters will probably need to push for more automation and reduced personnel in order to maintain and improve their position on the cash cost curve. We believe that one way of achieving that objective is through 4.0 technologies implemented in the plants. Therefore, we believe that it will become mandatory for smelters to move towards that direction even if the change is somewhat risky and difficult, and requires lots of energy and investment.

On another token, with all new usages found of the grey metal, we trust that the industry will gain better vitality and will still show the same dynamism in keeping a step ahead; as an example, the new self-disinfecting anodized aluminium developed by A3 Surfaces Inc.



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