



fives

Industry can do it

2021

ANNUAL AND CSR REPORT
#2020 Financial Year



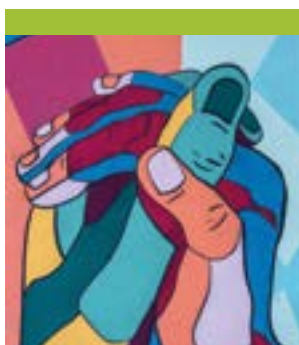
TABLE OF CONTENTS

«Faire aimer l'industrie».
With its new sense of purpose, Fives demonstrates its commitment to make industry the answer to all challenges. To achieve this, the Group relies on four values: a virtuous, cutting-edge, mutually responsible and exciting industry.



An exciting industry 5

Chairman and CEO's message 5
Human resources 7



A virtuous industry 9

Finance 11
Governance 14
Ethics & Risk management 18
Health & Safety 21



A cutting-edge industry 23

Innovation 24
Services & Digital 27
Additive manufacturing 30



A mutually responsible industry 33

High Precision Machines 34
Process Technologies 37
Smart Automation Solutions 51
Transversal activities 54
Environment 57

An industrial engineering group,
Fives designs and manufactures
machines, process equipment and
production lines for the world's
largest manufacturers.



EXPERTISE SERVING MANY MARKETS

STEEL AERONAUTICS ALUMINUM
AUTOMOTIVE ENERGY CEMENT &
MINERALS CHEMISTRY & PETROCHEMISTRY
LOGISTICS OIL & GAS SUGAR MACHINING
GLASS [...]



We started 2020 with solid fundamentals, which enabled us to weather the storm with minimal impact on our balance sheet and profitability. We are now beginning to see the end of the crisis and our growth prospects are strong in the years to come.



KEY FIGURES

€ 1,610 million
of sales

€ 1,612 million
of order intake

€ 28,8 million
R&D investment

2 016
patents in force
in 612 families

+8,000
employees



Order intake by geographical area



35%

AMERICAS

38%

EUROPE

7%

AFRICA
MIDDLE-EAST

20%

ASIA
OCEANIA

An international presence, as close as possible to manufacturers

Employees of
79
different
nationalities

Test and research
centers in
7
countries

+ 100
locations
in 30 countries

To RELIVE THE YEAR
2020 IN PICTURES,
scan this QR code



fives
Industry can do it

New brand signature
"INDUSTRY CAN DO IT"
and new Group values to stay the course
of FAIRE AIMER L'INDUSTRIE

An exciting industry

Built on ethics, respect, diversity and frugality



Chairman and CEO's message

Commitment

The pandemic turned both our personal and professional lives upside down. In all its Subsidiaries, Fives established appropriate health measures and adapted working methods, giving top priority to protecting the health of employees, partners and customers. These measures were deployed smoothly, as digitalization of internal processes and teleworking had been anticipated a few years earlier. Throughout the world, Fives teams demonstrated unique commitment and solidarity.



Frédéric Sanchez
Chairman & CEO

The pandemic also disrupted our markets, and in 2020, the world suffered the worst recession in decades. The successive waves of the pandemic, the stop and go policies, and the lack of short-term visibility on the way out of the crisis, shook the confidence of the major industrial players - our clients - who postponed many of their investment decisions. With the shutdown of numerous factories and imposed travel restrictions, the service-based activities also suffered. Consequently, the Group received orders amounting to €1,612 million, down by 12% compared to 2019.

In this context, however, the Group had some notable successes. By relying on a long-standing decentralized organization, we succeeded in being agile and creative in order to seize the commercial opportunities that came along, pursued our transformation and innovation programs, our environmental and human resources initiatives.

Chairman and CEO's message

Resilience

We started 2020 out on solid ground, and this helped us to weather the storm by minimizing its consequences on our balance sheet as well as on our profitability.

The weakened commercial environment and turbulence, caused by the health crisis, critically affected our 2020 sales, which reached €1,610 million, down by nearly 20% compared to 2019. However, **the Group's profitability endured, given the situation**. The operating margin reached 5.1% of sales; just 1 point lower than in 2019, thanks to the efficient control of the margins in execution on existing contracts, and our ongoing efforts to reduce overheads, as well as the support measures put in place by respective governments.

Finally, the Group had almost €300 million in cash on the balance sheet as of December 31, 2020. This comfortable level of liquidity was achieved thanks to State guaranteed loans in France, Italy and the United States, providing us confidence in our ability to continue to deliver on our commitments and invest in preparing for the future.

Confidence

At a time when vaccination campaigns are accelerating worldwide, **we are beginning to see a glimpse of the end of the crisis, and our prospects are becoming clearer**.

Fives succeeded, despite the pandemic, in securing order bookings totaling €1,372 million at end 2020; stable when compared to 2019 (at constant exchange rates) and with good margins, providing us with positive visibility for the coming months.

Group sales are expected to return to growth in 2021, driven by the Smart Automation Solutions backlog, stimulated in turn by the boom in e-commerce and distribution. Our High Precision Machines and Process Technologies Activities, where we have further reduced the break-even points by working on overheads, will be positioned to bounce back as soon as their markets are better situated. The massive recovery plans put in place by our governments are also expected to result in a more marked recovery by mid-2021, and allow us to exceed our 2019 sales and profit levels by the end of 2022.

Taking a long-term perspective, the health crisis has accelerated some fundamental market trends that we had already anticipated in our strategic planning, offering growth potential. **Digitalization** – the fuel of all our technological solutions – is the key to the industry of the future. **The fight against climate change**, which is at the origin of all our R&D programs over the last ten years, is an increasingly important driver for our activities. **Trade is becoming more regionalized**. This main driver for our international development over the last two decades is more topical than ever, as part of a drive for national sovereignty over strategic sectors, and priority given to local employment and economic players.

In 2020, Fives adopted a new set of values which will lead us towards a **virtuous, cutting-edge, mutually responsible and exciting industry**. They allow us to strongly reiterate our commitment to demonstrating that "Industry can do it" and looking to the future with confidence.



Human resources



Céline Morcrette
Human Resources Director

2020 has tested organizations and their employees, calling more than ever on their capacity for resilience. Fives' teams have been able to demonstrate their responsiveness and flexibility, and to adapt in this exceptional context, while continuing to build the Fives of tomorrow.



Overcoming the shock, getting organized to deal with a new reality

In the face of the pandemic, part of Fives teams focused on the operational management of the crisis, with the priority of protecting the health of people working for and with Fives, in a wide variety of situations (geographical, office/workshop). New working methods have been implemented (teleworking, remote customer assistance, etc.) thanks to the recent deployment of a common platform and collaboration tools, but also to the support of management teams in implementing the measures best suited to their health and operational situation.

At the same time, new tools have been developed to promote information sharing, to bring the corporate culture to life, and to strengthen ties that had been weakened by confinement and remote working. The Group has multiplied its internal communication initiatives, based on a digital ecosystem: a new Group intranet, regular animation of a corporate social network, and management communication through videos, written messages and webinars.

Human resources

Continuing to build the exciting industry of tomorrow

In a context where the urgency of the situation has shifted priorities, the HR teams have nevertheless continued their in-depth work on supporting and developing talent within the Group. The CEDREs (Human Resources Evaluation and Development Committees) were held to assess the contribution and potential of each employee and implement appropriate action plans (training, coaching, co-development, etc.). A

project is currently underway to optimize these action plans in order to formalize career paths and associated training programs, so as to provide faster and better support for employee development and the evolution of talent. In addition, in 2020, the emphasis was placed on diversity and actions aimed at talent of women, to support and encourage them to take up positions at all levels of the organization.

KEY FIGURES

8,047
employees

18%
of women in management

79
nationalities

63%
of employees have attended training



FOCUS Training employees, for today and tomorrow

The Group is continuing to consolidate the Fives Leadership Factory by integrating training cycles related, for example, to digital technology, transformation and change management, in order to support employees and managers in the challenges of today and tomorrow.

While respecting the autonomy of its Subsidiaries, Fives has qualified and centralized a training offer aimed at developing a common Group culture for all its employees, particularly on key subjects such as leadership, management, diversity, security and cybersecurity; on this last theme, for example, the Group has developed its own modules to raise awareness among all its employees.

E-learning makes it possible to broaden the range of courses offered, both qualitatively and quantitatively, while giving employees the opportunity to pace their training program. The context of the year 2020 has accelerated the availability of new training courses, including in the form of virtual classes.

A virtuous industry



Built on ethics, respect, diversity and frugality

In 2020, the global COVID-19 pandemic reminded us how quickly the world can change, and that industrial companies face complex and varied problems. More than ever, organizations must adapt to these ongoing changes, and transform to demonstrate their resilience.

As a company with two hundred years of history, Fives has coped with crises and revolutions in the past while remaining loyal to its sense of purpose: Faire aimer l'industrie. In 2020, the Group reiterated its willingness to do business ethically,

creating long-term value for all its stakeholders. For this purpose, it relies on a frugal management style, agile governance and strict business ethics. Fives has also maintained its Corporate Social Responsibility (CSR) commitments announced in 2019, which are based on four pillars:

- Be an exemplary employer
- Minimize the environmental footprint of Fives and its customers
- Contribute to regional development
- Be a responsible economic figure.

Fives' CSR approach is regularly assessed by external organizations:



Global Compact

Fives, a member of the United Nations Global Compact since 2011, underlines its role in a global community of companies concerned about Human Rights, working standards, the environment and the fight against corruption.

[Learn more](#)



EcoVadis

Since 2012, Fives has been rated by EcoVadis, a corporate social and environmental rating agency. In 2020, with a score of 78/100, Fives was given the status of "Platinum" supplier, in the top 1% of rated companies.

[Learn more](#)





Vigeo Eiris

In 2020, Fives was rated for the first time by Vigeo Eiris, a leading non-financial rating agency. V.E. rates organizations' consideration of social and environmental factors and governance in their strategy, their operations and their managerial functions. The score given to the Group places it in the top third of the industry's companies, and allows it to identify areas for improvement.

[Learn more](#)



Solar Impulse

Fives is working to receive certification for some of its products from the Solar Impulse Foundation, which is committed to promoting efficient technologies to combat climate change. The Solar Impulse Efficient Solution label is awarded to industrial solutions which are environmentally-friendly and profitable.

[Learn more](#)

Finance



Suresh Abye
Finance Director



In spite of a decline in sales by nearly 20%, which can largely be attributed to the COVID-19 crisis, the quality of our contract execution, in the face of difficult conditions, and our efforts to reduce structural costs, allowed us to record an EBITDA margin of 5% in 2020, less than one point below 2019.



A commercial environment affected by the COVID-19 crisis

The year 2020 opened on the COVID-19 pandemic, first in China and then above all in Europe, as well as in the majority of locations where the Group operates. With this health crisis, the world experienced its worst recession in decades, and its effects lasted beyond the sudden stop of the second quarter.

In this context, and given the lack of short-term prospects for the end of the crisis, the majority of the Group's clients adopted a wait-and-see approach with regard to investment decisions, which were continually postponed; meanwhile, some service activities were affected by a number of plant shutdowns and the inability to go to customer sites. Only Smart Automation

Solutions continued to grow, driven by underlying factors linked to e-commerce and distribution (automated logistics platforms), for which the potential was further enhanced by the constraints imposed by the health crisis.

In the light of these trends, orders placed with the Group in 2020 amounted to €1,612 million, down 12% on 2019 (€1,841 million), with however extensive disparities according to market segment. Smart Automation Solutions went up by 16%, whereas High Precision Machines and Process Technologies were down 22% and 36% respectively.

Finance

ORDER INTAKE BY ACTIVITY

€ millions	2019	2020
Smart Automation Solutions	581.3	672.5
High Precision Machines	352.0	274.9
Process Technologies	761.4	490.0
Transversal activities and other activities	146.0	175.0
Total	1,840.7	1,612.4

ORDER INTAKE BY GEOGRAPHICAL AREA

€ millions	2019	2020
Americas	476.4	560.7
Asia and Oceania	382.7	320.1
Europe	836.2	622.3
The Middle East & Africa	145.4	109.3
Total	1,840.7	1,612.4

In geographic terms, the impacts have been strongest in Europe, where the lockdowns have been the most rigorous, and where the Group Subsidiaries, heavily reliant on exports, have been penalized by travel restrictions.

In contrast, Subsidiaries mainly serving their local markets performed better. Order intake even grew in North America, while Japan - relatively unscathed - and China - bouncing back thanks to the government's proactive policy - have in the course of the year recovered the ground lost in the first quarter.

Remarkable operational performance despite difficult execution conditions

As an engineering group accounting for most of its sales by percentage of completion and benefiting from an order book worth €1.4 billion at the start of the 2020 fiscal year, Fives had workload to execute, avoiding full business suspension.

Sales for 2020 amounted to €1,610 million, which is down nearly 20% on 2019 (€1,999 million). On top of the effect of the lower opening order book, the consequences of the health crisis were felt in two ways. First, the fall in order intake - along with a number of orders that were finally booked during the year, but after several months of delay - negatively impacted activity; the High Precision Machines (-30%) and Process Technologies (-26%) Divisions were particularly affected. Second, travel restrictions and the closure of customer sites led to a slowing of progress in ongoing projects; the Smart Automation Solutions Division thus recorded a (slight, at -7%) reduction in sales, despite the growth of its order book.

Group EBITDA was €81 million in 2020, down €39 million on 2019 (€120 million). This fall was attributable to the consequences of the COVID-19 crisis, as lower activity volumes, impacting both sales and margins (through lower absorption of salaries and fixed production costs), have not been fully offset by the benefit from temporary support

measures (partial unemployment, grants, social contribution exemptions) implemented by governments of the countries where the Group operates.

Good performance in preserving margins in the execution of ongoing contracts despite overruns caused by the health situation, as well as structural savings achieved through cost-reduction initiatives, particularly in payroll, however allowed to maintain a profitability of 5.1%, less than one point below 2019 (6.0%).

KEY FIGURES

€ millions	2019	2020
Sales	1,998.9	1,610.2
EBITDA	120.3	81.5
%	6.0%	5.1%

Strong prospects for 2021

The Group ended 2020 with an order book standing at €1,372 million, down €30 million on 2019 (€1,402 million) due to forex effects (-€32 million). At constant exchange rates, Fives was therefore able to stabilize its order book in spite of the pandemic, and without compromising quality, with the embedded margin also remaining stable.

ORDER BOOK BY ACTIVITY

€ millions	12/31/2019	12/31/2020
Order book at Dec. 31	1,402.1	1,372.2
Smart Automation Solutions	504.7	624.5
High Precision Machines	190.3	166.7
Process Technologies	611.9	454.4
Activités transverses et autres activités	95.2	126.6
Total	1,402.1	1,372.2

Furthermore, the Group starts 2021 with nearly €300 million cash on hands. This comfortable level of liquidity notably achieved thanks to loans guaranteed by the French, Italian and American states, secures the Group's ability to continue its operations under good conditions and to support the growth of its various activities.

Sales in 2021 should grow, driven by strong growth in Smart Automation Solutions' order book, while the recovery from the crisis anticipated from the second quarter (in particular thanks to acceleration in the vaccination process) should enable High Precision Machines and Process Technologies - whose break-even points have been further lowered - to bounce back after the low point reached at the end of 2020. The massive stimulus packages planned by governments should also encourage a more distinct recovery from mid-2021.

Governance



Agile governance to handle complex situations

At the end of 2018, Fives modified its governance and management structure to become more agile and be able to better respond to its constantly changing markets. In 2020, in the unprecedented context of the health crisis, this organization demonstrated its strength and ability to respond rapidly to complex and varied problems worldwide.

Fives, a simplified joint-stock company (SAS), is led by its Chairman and Chief Executive Officer, Frédéric Sanchez, who relies on a Deputy Chief Executive Officer, Martin Duverne. The Group is overseen by a Supervisory Committee, including members from outside the Group.

The Chairman and the Deputy Chief Executive Officer are assisted with decision-making by operational bodies, including the Senior Executive Committee. The latter is supported by an Executive Committee and Local Coordination and Steering Committees.

The Supervisory Committee: independent members for external insight

With members from outside the Group, the Supervisory Committee meets several times a year and is responsible for overseeing Fives' management. The range of experience, skills and personalities makes it a major asset to discuss challenges and industrial prospects and to assess the Group's development.

— **Chairman: Philippe Reichstul**

Members as of December 31, 2020:

- François Dufresne
- Dominique Gaillard
- Alain Cianchini
- Heyoung H Lee Bouygues
- Jean-Georges Malcor
- Antonio Marcegaglia
- Laurence Parisot
- Jean-Dominique Sénard

The Senior Executive Committee:

a compact management body to define Group's crossfunctional priorities and policies

The Senior Executive Committee manages talent and development, responds to cross-functional operational and organizational questions and makes the required budgetary decisions. It also manages unforeseen events with a potentially significant impact on the life of the Group, as well as crises or emergencies. Its members sit on the Executive Committee.

- **Frédéric Sanchez, Chairman and Chief Executive Officer**
- Martin Duverne, Deputy Chief Executive Officer
- Denis Mercier, Deputy General Manager of Fives
- Suresh Abye, Finance Director
- Raphaël Constantin, Deputy General Manager, President of the High Precision Machines Division
- Alain Cordonnier, Deputy General Manager, President of the Cement & Minerals Division
- Sébastien Gauguier, President of the Aluminium Division
- Guillaume Mehlman, Deputy General Manager, President of the Steel & Glass Division
- Céline Morcrette, Human Resources Director
- Luigi Russo, Deputy General Manager, President of the Smart Automation Solutions Division
- Frédéric Thrum, Deputy General Manager, President of the Energy Division
- Michelle Shan, Country Director - China

Governance

The Executive Committee:

a place for dialogue, exchanging information and sharing experiences, further strengthening the cross-functional effectiveness of the Group's actions

The Executive Committee is primarily in charge of ensuring the implementation of decisions made by the Senior Executive Committee and reviewing the relevance and effectiveness of cross-functional policies based on feedback.

- **Frédéric Sanchez, Chairman and Chief Executive Officer**
- Martin Duverne, Deputy Chief Executive Officer
- Denis Mercier, Deputy General Manager of Fives
- Suresh Abye, Finance Director
- Hervé Boillot, Mergers & Acquisitions, Strategy Director
- Daniel Brunelli-Brondex, Country Director - India
- Jean-Marie Caroff, Director of International Development
- Raphaël Constantin, Deputy General Manager, President of the High Precision Machines Division
- Alain Cordonnier, Deputy General Manager, President of the Cement & Minerals Division
- Sébastien Gauguier, President of the Aluminium Division
- Arnaud Lecœur, Group General Counsel
- Guillaume Mehlman, Deputy General Manager, President of the Steel & Glass Division
- Céline Morcrette, Human Resources Director
- Frédéric Renaud, Country Director - Italy
- Luigi Russo, Deputy General Manager, President of the Smart Automation Solutions Division
- Frédéric Thrum, Deputy General Manager, President of the Energy Division
- Michelle Shan, Country Director - China
- Thierry Valot, Innovation & Digital Director

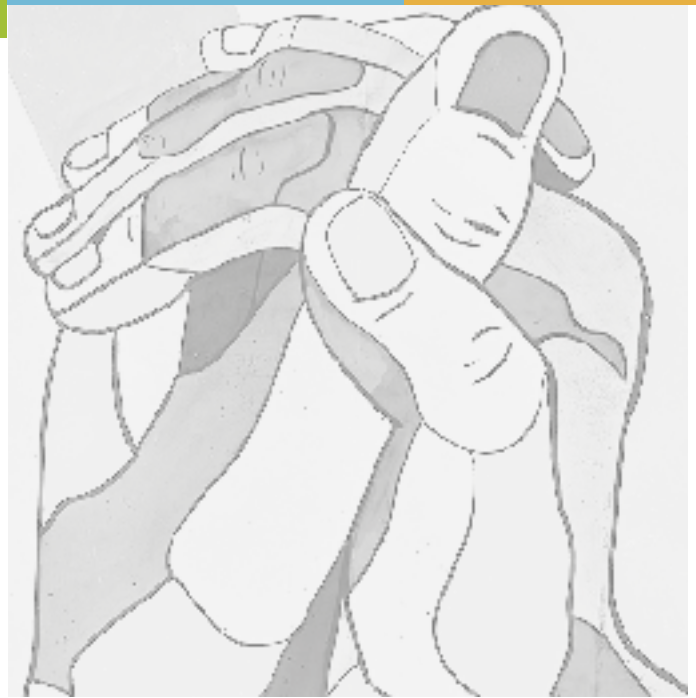


The Country Coordination and Steering Committees: implementing Group policies wherever Fives operates

These committees are responsible, by geographic area, for ensuring the implementation of the cross-functional policies adopted by the Senior Executive Committee, adapting them

where appropriate to the specifics of each country, and encouraging synergies between subsidiaries in the same country but that belong to different Divisions.

Ethics & Risk management



Denis Mercier
Deputy General Manager



In 2020, in an unusual context which required more vigilance than ever, we further reinforced our risk management system. We continue to organize ourselves and to acquire tools which make Fives a strong group when faced with all types of challenges, including cyber risks.

How can we manage instability, protect ourselves against new threats and remain vigilant regarding risks, while ensuring business continuity?

In the highly unusual context of 2020, Fives quickly realized the very wide range of risks that the Group could face (health risks, contract interruptions, etc.) and the urgency of providing appropriate responses to minimize them. Its customers have

themselves become more demanding as to the soundness of their suppliers' fundamentals, and attentive to their speed of adaptation to health conditions and to maintaining the quality of their products and services.

The work to reinforce protection systems against different risks - which were mapped in 2018 - has continued, to be able to look to the future with confidence.

Organizing the risk management approach

This approach is based on two pillars: on the one hand, constant dialog between the Group Headquarters and Subsidiaries, and on the other hand, a system comprising:

- a risk committee which monitors control of the Group's major risks;
- Group Directives which are a collection of rules applicable to all Group Subsidiaries;

- an internal audit team which carries out assignments at Senior Management's and the risk committee's request to assess major risk management systems, notably in the context of monitoring the application of Directives.

Ethics & Risk management

Making business ethics a core priority for our business

In 2020, new internal actions to promote anti-corruption measures were organized. During International Anti-Corruption Day, Group executives and managers reiterated Fives' firm

commitment to combatting all forms of corruption. Work to reinforce Group third-party review processes has begun, in order to control compliance issues linked to third parties.

HIGHLIGHTS



BUILDING AWARENESS

Training to raise general awareness regarding risks

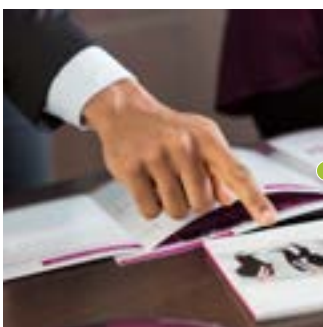
Fives took advantage of the slowdown in activity during lockdown to train employees remotely, notably in preventing corruption, compliance of Group export operations and cybersecurity. This training initiative was supplemented by e-learning tools.



CERTIFICATION

Streamlining international operations

Fives launched a customs certification process for several of its companies, as part of the deployment of its internal compliance program. Alongside this, the Group organized its approach, with the creation of local units and communities (logistics staff, internal customs staff), in order to encourage cooperation between Subsidiaries.

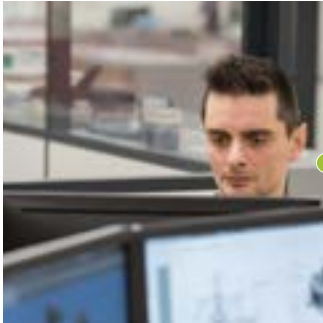


DIRECTIVES

Revised Directives to consider new Group challenges

The Directives, a risk control and management tool for Subsidiary management committees, were updated in order to take into account changes to the Group in terms of organization, size and business lines. Webinars, e-learning and working sessions helped with deployment.

Ethics & Risk management



CYBERSECURITY

Objective: resilience against cyber attacks

For greater resilience against the risk of cyberattacks, the Group has established a roadmap to organize its approach and has implemented an action plan: risk analysis at Group level, appointing a point of contact within each Division and implementation of a monthly committee.



FOCUS

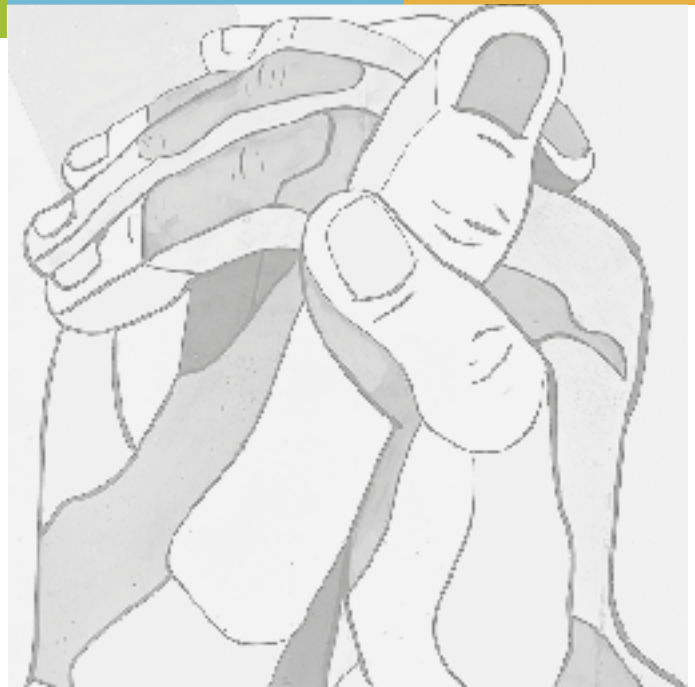
Cybersecurity: crucial for industry 4.0

The cyber threat is growing, both in terms of sophistication and numbers. Cyberattacks rose in 2020, as the difficult period led users to lower their guard. Fives is concerned on two grounds.

On the one hand, the Group must protect its industrial secrets and data. It therefore carries out actions to secure information systems and raise employees' awareness of this issue (regular communication, phishing exercises, etc.).

On the other hand, industrial equipment with a long life cycle is vulnerable. Industrial players have become more developed in terms of cybersecurity and require an increasing number of guarantees regarding the security of their production data. Fives adapts its offer and its approach. Fives Landis Ltd began a certification approach based on a specific framework to work with a car manufacturer, while Fives Intralogistics SpA became ISO 27001 certified at the request of its customer FEDEX. The Group has also established a partnership with WALLIX to protect data generated by connected industrial machines.

Health & Safety



Martin Duverne
Deputy Chief Executive Officer

The COVID-19 pandemic reminds us that health is incredibly important, impacting the very functioning of organizations. Fives has made every effort to ensure that its employees have been kept safe and well during this unusual period, while continuing to maintain its business targets where possible.

Keeping people safe, safeguarding the business

Due to its business in China, Fives was affected by the COVID-19 pandemic very early on, before it spread to all the countries where the Group operates. The Group's agile organization allowed it to rapidly adapt to this exceptional situation, with the definition of a central framework later

adapted by each region. Fives considered local health and safety rules and recommendations, adapting them into health protocols adapted to specific local situations.

KEY FIGURES

Frequency rate
2.65

Severity rate
0.1

Number of serious lost-time accidents
reduced by 2/3
since 2009

Health & Safety

Safety: a successful program

2020 marked the end of the “2020 Safety Ambition” program launched in 2017.

The Group made progress thanks to the professionalism of all its Health, Safety and Environment (HSE) teams and the involvement of all employees, both at Group and Subsidiary level. The sharing of best practices, the implementation of tools, training, but also the deployment of control systems helped improve Group Safety performance. Objectives in terms of frequency rate and number of lost-time accidents were reached. However these results should be considered

with care. The pandemic changed the company’s working organization and therefore the nature of Health & Safety risks: fewer people on site and closer supervision, travel restrictions and an increase in working from home.

In 2021, the Group will pursue its action plan to further reinforce the Safety culture at each Subsidiary, with the objective of “zero fatal accidents and zero serious accidents”. Moreover, priority will be given to risk prevention actions linked to employee activities at customer sites.



FOCUS

An application to better understand Safety on a daily basis

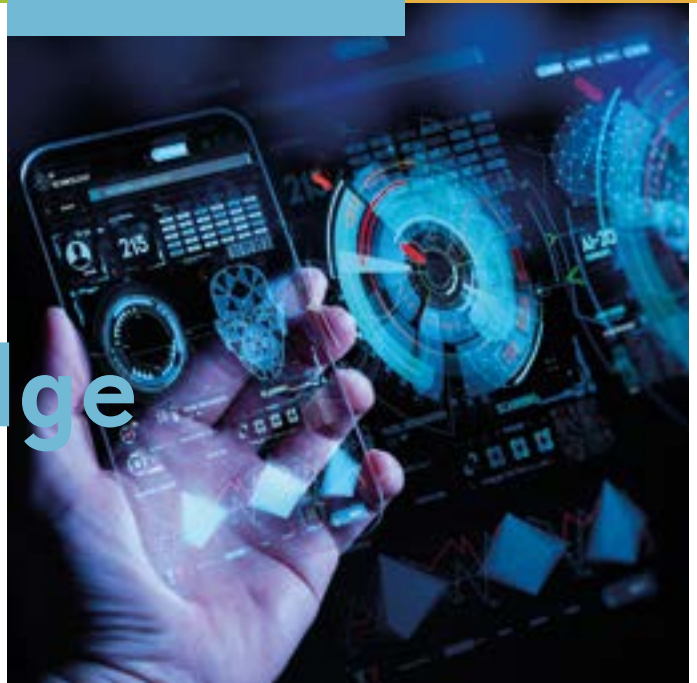
The Fives Aluminium Division has developed an application which completely digitalizes the Safety information sharing process, enabling real-time data feedback and improved monitoring of actions taken.

It combines several types of Safety actions performed on a daily basis: SafetyStop (risk analysis before a task), FSOD (Field Safety Observation & Dialog: safety interaction), Find-It/Fix-It (identifying, reporting and resolving a problem or notifying a third party to take action), or even equipment inspection (checking multiple compliance points for equipment used). A real toolbox, it combines several functionalities: reporting incidents, associating an action plan, checking hazardous product files, viewing performance in real-time, etc.

The intuitive interface makes the tool easy to use, resulting in a better understanding of Safety by users, including while working at third-party sites.

This tool is currently being expanded to other Group activities.

A cutting-edge industry



Built on confidence in the future, the ability to reinvent ourselves, and visionary projects

Since its inception, Fives has coped with industrial revolutions thanks to its ability to continually reinvent itself, supported by its bold engineers, its ability to listen and anticipate industrial company needs, and continual R&D efforts. These three drivers make Fives a company focused on innovation, to look forward to the future with confidence.

In 2020, Fives continued to look ahead and develop visionary projects, seeking to always better serve its customers' ambitions. Two strategic focuses are at the heart of this approach: digital, and the development of technologies and solutions meeting the challenge of the environmental transition.

Innovation



Thierry Valot
Innovation & Digital Director

In 2020, Fives maintained its commitment to innovation, reflecting the group's tradition as a pioneer. We have continued towards our objective of responding to industrial performance and durability challenges, and we are increasingly relying on digital to do so.

Fives' areas of R&D work reinforced

In 2020, the pandemic accentuated two trends which have a significant impact on industry, and which were already at the heart of Fives' innovation strategy:

- digitalization, both for internal processes and production processes, which helps meet the need to limit physical interactions while offering greater flexibility and responsiveness. It also helps industrials to optimize the use of their facilities;
- combatting climate change, with greater awareness under public pressure, resulting in a change in the investment strategies of industrial players. Fives' R&D teams are therefore working to support them with their energy transition, notably in new energy sectors (electrification, hydrogen). This environmental approach also translates into machine modernization projects.

KEY FIGURES

€28.8
million in R&D investment

31
R&D and test centers

2,016
patents in 612 families,
including 50 filed in 2020

Innovation

Consolidating our position thanks to a solid and flexible organization

At Fives, this thirst for innovation is thriving within an agile organization, designed to accelerate innovation, capable of working on research topics and roadmaps.

In 2020, the Group consolidated the drive to reorganize its R&D and Innovation functions, now aligned with Fives' organization

into three major Activities. Within each Division, R&D and Digital managers develop programs, supported by a lightweight central structure which offers its specific expertise. This organization encourages synergies and reflection on cross-business topics, and notably aims to ensure full integration of digital into development programs.



FOCUS

Fives Intralogistics SAS: a new showcase of the industry of the future

Fives' Smart Automation Solutions activity has experienced a boom in recent years, notably driven by the dynamic e-commerce sector.

This rapid growth led to the creation of a center of expertise for conveyors in Chasse-sur-Rhône (Isère, France), which reflects the Group's commitments in terms of digitalization and respect for the environment.

A digital twin, developed with local partners, now ensures digital continuity of projects from the first discussions with customers through to virtual commissioning. A virtual reality room allows customers to be immersed in a 3D experience of their complete facilities, as well as Fives' entire range of conveyors. This approach allows Fives to offer its customers tailored solutions in short time frames, while remaining competitive compared to standard imported solutions.

This project was supported by the Vienne-Condrieu urban area, certified as an "industrial area", and the Auvergne-Rhône-Alpes region, and was labeled a "Showcase of the Industry of the Future" by the Alliance Industrie du Futur.

HIGHLIGHTS



DECARBONIZATION // VERCANE

Reducing the CO₂ emissions of glass production

Fives, ENGIE, Saverglass and Verescence have launched “VERCANE” to support the glass industry to decarbonize its production activity. This R&D program studies different carbon neutral energy systems that could be compatible with the glass melting process: hydrogen, bioresources and electrification.

[More information](#)



PARTNERSHIP

Accelerating innovation thanks to EIT Manufacturing

Four Fives R&D projects are in line for support by EIT Manufacturing, a European organization aiming to promote and finance projects for industry, of which Fives is a founding member. This support will allow Fives to collaborate with new partners and to benefit from external skills.

[More information](#)



CREATIVITY

Fives Innovation Awards: expressing creativity

After nearly 10 years, the Fives Innovation Awards are a key part of the Group’s innovation system. In 2020, the Grand Prize was awarded to a Fives Stein team (Steel & Glass Division) presenting a breakthrough technology solution for steel treatment lines with a direct flame preheating section.

Services & Digital



Marc Aouston
Strategy & Marketing Director

Facing a volatile and uncertain world requires agility: Fives supports its customers with this challenge, throughout the life cycle of their equipment, notably using solutions based on digital technologies. Digital is both a major driver of innovation and crucial for our transformation.



Every day, digital demonstrates its relevance for an industry seeking flexible, reliable and more environmentally friendly and human-friendly production solutions. This momentum has been accentuated in 2020, in the context of restricted travel and physical interactions.

Digital services vital to the Fives value proposal

The services proposed by Fives maximize the performance of its customers' production tools. They combine a thorough understanding of manufacturing processes and controlled power of digital and cover the entire product life cycle: modeling (digital twins), operator training, virtual commissioning, monitoring equipment performance during the operating phase,

maintenance (including predictive), remote fault analysis and troubleshooting, etc. Fives teams have a range of digital tools to ensure, on site or remotely, effective operation of production lines, all while guaranteeing a high level of cybersecurity and integration in customer production management systems.

Services & Digital

Allowing industry players to get the most out of their equipment

The quest for performance requires Fives teams to listen carefully and collaborate with its customers to better understand their problems and propose tailored solutions. Reduced energy consumption, improved product quality, automated facilities,

better overall line performance, equipment flexibility throughout their life cycle, etc. are some of the issues which Fives solves with ad hoc and effective solutions.

HIGHLIGHTS



ACTION PLAN

A digital roadmap for greater responsiveness

In 2020, the Group updated its digital roadmap to propose increasingly economic, relevant and rapid solutions. Its different actions are focused on three areas: human-machine interaction, the importance of the environment and services.



CUSTOMER FOCUS

Aluminium: connected services, top technical support

Thanks to the “Fives Connect” service platform, customers of the Fives Aluminium Division now have access to an interactive and customized catalog of spare parts, which allows them to easily identify the part they need, using exploded views. It also offers tracking of the part orders in progress.



AGILITY

Equipment commissioning in record time

Fives provided its Chinese customer Xinyu with a rolling mill for silicon steel processing. With the travel restrictions linked to the COVID-19 pandemic, the teams adapted to carry out the 79 required tests, adjustments and settings remotely, in spring 2020. The equipment was commissioned in just four months.

Services & Digital



PROXIMITY

A service hub for maximum responsiveness

The Fives Services Gulf workshop in Bahrain, designed to meet the needs of aluminium producers, is now used for other Group activities. Fives Nordon (a specialist in industrial pipework) was able to very quickly meet a requirement for an urgent repair in a gas production plant in Saudi Arabia.



FOCUS

Fives Remote Services: full Fives expertise, even remotely

Thanks to digital, Fives can overcome geographic constraints to guarantee business continuity, greater responsiveness, support for operational teams, a high level of expertise and quicker problem solving for industry players.

In 2020, Fives launched Fives Remote Services, a brand which promotes its remote digital assistance services. It is based on three pillars: teams of experts, specific devices and systems (connected glasses, tablets, smartphones, etc.) and digital tools (communication applications, vision, connectivity, interoperability) without compromising on operational safety or cybersecurity.

In June 2020, Fives Intralogistics SpA implemented this offer for the first time for an e-commerce giant, to carry out urgent work at one of its sites in Italy without a production shutdown. The Fives Remote Services brand can be awarded to all Group Subsidiaries whose service offer meets seven criteria: customer focus, service performance, use cases, health and safety of workers in the field, cybersecurity, preparing for an immediate and successful market launch, added value for the customer and a business model which generates growth for Fives.

Additive manufacturing



Franck Moreau
President, AddUp



Julien Marcilly
COO, AddUp



The AddUp teams have demonstrated remarkable resilience not only in managing the pandemic, but also the changes implemented to lead the company towards a promising new industrial future.



Through AddUp, its joint venture with Michelin, Fives offers comprehensive metal 3D printing solutions, a market segment for which the company is now the French leader.

COVID-19 impact and good long-term prospects

The pandemic had an immediate effect on AddUp's volume of business; notably, the production of parts for certain sectors such as Formula 1 which was over even before it had started.

However, 3D printing continues to stand out as an alternative production method, which meets the growing need for

a more resilient supply chain, offering greater flexibility, local manufacturing and reduced material consumption. Today, additive manufacturing is increasingly integrated into companies' strategic considerations; this momentum is strongly supported by the French state, notably through the economy recovery plan.

Additive manufacturing

Maturity, restructuring the organization and refocusing the offer

Founded in 2016, AddUp entered a new phase of its development in 2020.

Firstly, following a period of strong external growth, the organization was transformed to provide a more comprehensive offering, supporting a unique brand based on shared values. In addition, the commercial offer was refocused to ensure it is aligned with customers' needs. AddUp added further momentum

to its part production activity, thanks to new advances in process control and new processing capacities, to create parts in very different materials and sizes, for a large number of sectors (energy, luxury, aeronautics, space, automotive, defense). Moreover, the company developed its after-sales offer with ad hoc maintenance programs based on the needs of industry figures and with the provision of a dedicated web portal. Work on predictive maintenance is in progress.

HIGHLIGHTS



ORDER

Two FormUp 350 machines for Wright Medical

The next-generation FormUp 350 machine was selected by Wright Medical to produce titanium prosthetics. Its productivity, the quality of parts and close collaboration with the teams throughout the project were highly appreciated by the customer; a first machine was delivered in France, before a second in the United States.



PARTNERSHIP

Successful cooperation with PSA for custom parts

Thanks to its close collaboration with the PSA teams, AddUp developed and mass produced an interior trim part for DS7 Crossback x Louvre vents. The use of fine powder helped obtain a very precise design and an exceptional finish.



JAPAN

Supporting Japanese customers with additive manufacturing

AddUp established the foundation of a service offer in Japan thanks to the creation of a proof of concept, access to training and the production of small series. This service will be equipped with two machines to operate several materials, with a full team. It will also provide maintenance and an after-sales service.

Additive manufacturing



UNIQUE DESIGN

Production of 3D parts for the next generation of FormUp 350

The next generation of the FormUp machine will have several AddUp technology parts, notably with replacement of a bored block weighing nearly 8.7 kg with a part recreated with a design which can only be made with 3D printing; it will weigh 2.4 kg, i.e., 70% lighter and 70% less material consumed.



POWDER

Constellium chooses the AddUp subsidiary Poly-Shape for its new range of powders

The world leader in high-performance aluminium has chosen Poly-Shape (AddUp group) to exclusively develop the first recipes and produce the first parts with its new powder. Specially designed for additive manufacturing, Ahead® offers unrivaled thermal stability and is positioned as an alternative to titanium.

[More information](#)



FOCUS

FormUp 350: a new powder bed fusion 3D printing machine

AddUp's flagship machine is ready for industrial use. It addresses the needs and challenges of staff safety, productivity, quality, investment control and integration.

It includes several innovations in this regard, particularly for the software suite, control of multi-laser strategies and the powder management module. The machine is modular and scalable to adapt to current and future needs.

In addition, this machine integrates perfectly into any customer environment thanks to excellent interoperability. Aware of the difficulty of incorporating additive manufacturing into the production chain, AddUp has developed a range of services to support customers at each stage of their journey. Specific maintenance programs help guarantee excellent machine availability.

A mutually responsible industry



A partnership-based approach with all our stakeholders, built on a dialogue with our clients on the ends and means, and the determination to overcome challenges.

Greater flexibility, speed, reliability, excellent performance, a perfect quality of the final product, reduced inputs, reduced polluting emissions, energy efficiency... plenty of requirements and challenges for the industry of the future.

Fives employs all its expertise to tackle these challenges. The Group's teams worldwide are listening to industrial companies to understand their problems and propose solutions based on cutting-edge proprietary technologies and reliable digital systems, throughout the equipment life cycle - an approach with shared responsibility, to build a more environmentally and human friendly industry, together.



High Precision Machines



Raphaël Constantin,
Deputy General Manager, President of the
High Precision Machines Division



Given the economic context, we have been able to maintain a respectable level of profitability throughout this period. Thanks to the responsiveness of our teams, our sound positions in markets less affected by this crisis, and our agility, we demonstrated our excellent resilience.

The High Precision Machines Division was faced with a sudden shutdown in 2020. It affected most of the activities in the aerospace and automotive sectors for nearly four months, both for new investments and for service. However, the implementation of strict sanitary measures made it possible to preserve everyone's health, while maintaining most of the activities in the other sectors.

Fives was able to proceed with the global installation of machines despite travel restrictions, thanks to its digital solutions and local team support.

The Division took the opportunity during this unprecedented time to confirm and accelerate its strategy in the defense and general industry sectors. In addition, the Division continued its developments in the aerospace and automotive markets, particularly for electric vehicles.

At the end of 2020, the Group acquired partial assets of Dufieux. This enabled Fives to expand its range of machines

and expert teams, including new technologies such as MMS® (Mirror Milling System), which replaces a chemical erosion process with a more environmentally friendly solution.

The High Precision Machines Division supports its customers throughout the project's life cycle, confirming its position as a long-term partner, developer and solutions provider, meshing machines and digital technology as one. Through this partnership, the Division accompanies its customers from the very beginning of a project to meet their needs, providing them with the necessary support before, during and after the equipment is put into production, anywhere in the world with local service teams.

Thanks to the consistency of the Division's strategy launched several years ago, supported by a continuation of investment in new solution development, the High Precision Machines Division continued with a market share gain and entered the 2021 year with a respectable order book and an optimized cost structure, thus further increasing its resilience.

High Precision Machines

HIGHLIGHTS



RETROFIT

Fives' expertise to retrofit non-proprietary machines

Relying on their technical expertise, Fives' Service teams in the USA responded to a critical need for a major player in the space sector by developing a custom engineered solution, including a Siemens control retrofit, an internally designed Gimbal head and the creation of a simulated Y-axis motion on two Pietro Carnaghi VTL.



AI

GrindXelerator, Artificial Intelligence to optimize grinding cycle time

By combining its technical expertise in grinding process and the use of a proprietary AI software, Fives has studied the operation of two Landis camshaft grinding machines, then defined and edited new profiles and parameters using AI. Once installed, they allowed the customer to obtain 20% cycle time saving and to optimize production volumes.

[Read more](#)



BORING

A Giddings & Lewis FTR machine for a major industrial player

Fives secured an order for a Giddings & Lewis FTR Floor Type machine featuring two rotary tables, for the production of engine parts. Machine acceptance by a major player in the Construction and Mining industry in Fives workshop is scheduled in August 2021 before its commissioning at the customer's plant in January 2022.



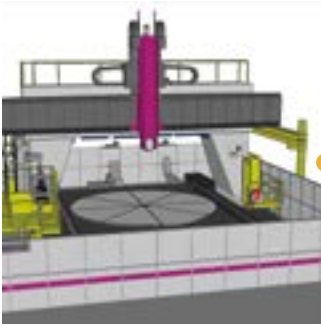
GRINDING

Two Landis 3LVE grinding machines for rotors and transmission shafts

Fives has delivered a Landis 3LVE to a large North American automotive OEM for grinding rotors and transmission shafts for their new Battery Electric Vehicle line, thus confirming the adaptability of its technologies to this rapidly expanding market. A second machine is currently being manufactured for delivery at the end of 2021.

[Read more](#)

High Precision Machines



NAVAL SECTOR

Fives to support the Marine sector with Liné Machines technologies

Fives has secured a significant order including the design and supply of a Liné Machines Macbormill Mill/Turn with a 7-meter diameter Rotary Table and a capacity of 100,000 kg, for manufacturing naval parts. The machine is scheduled to be shipped in January 2022, and the production to start in July 2022.



BEARING SYSTEMS

Fives pursues its grinding diversification strategy

Fives has secured two orders from a world leading bearing manufacturer. The first is for a Bryant RU2 grinding machine, which, thanks to its flexibility, will enable the customer to grind a large range of part families in the same machine. The second is for a Giustina XL-VSD to grind large bearings in the wind energy sector.

[Read more](#)



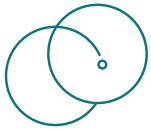
FOCUS MMS[®], an innovative and differentiating technology that meets environmental challenges

By taking over the assets and activities of Dufieux in November 2020, Fives has not only completed its range of 5-axis machines but has also enhanced it with a breakthrough technology: the Mirror Milling System.

This machining solution, developed in partnership with Airbus, enables high-speed milling, drilling and routing operations on 3D aluminum panels in a single cycle. Its major advantage is environmental, since it replaces a polluting chemical acid erosion process that is difficult to manage. Featuring a patented 2 x 6-axis facing system for ultra-precise positioning, the MMS[®] has a cycle time up to six times faster than the chemical erosion process, as well as a power consumption and footprint reduced by half. Finally, programming time for panel machining is improved with the Management Programming Tool software layer. With the MMS[®], Fives is pursuing its strategy of developing innovative solutions that are more respectful of the environment and adapted to the production requirements of tomorrow.

[Read more](#)





Process Technologies



ALUMINIUM

CEMENT & MINERALS

ENERGY

STEEL & GLASS



Sébastien Gauguier
President of the Aluminium Division



In 2020, we were able to support our customers to continue their industrial activities thanks to our accelerated innovation, notably in the field of digital technology, combined with the involvement of our teams and real proximity with our customers through our service subsidiaries. ”

Fives' Aluminium Division specializes in designing and supplying process equipment and complete installations to produce primary aluminium. Alongside this, Fives has developed a range of equipment and associated services to meet the higher standards and needs of customers in terms of performance, product quality, environmental footprint and cost savings.

In an environment marked by the sanitary crisis leading to a significant decline in global demand, notably in the automotive and aeronautics industries, Fives' Aluminium activity declined significantly. Aluminium stock surplus did not encourage industrial investment.

The events of 2020 represented a sizable challenge for engineering and service teams, which used new working methods to ensure continuity of projects and services. Thanks to remote assistance and collaborative tools, a virtual presence on site could be ensured, and complex tasks continued to be handled in close collaboration with customers. All over the world, Fives experts rallied to help aluminium producers to operate their facilities and to maintain their production with various remote maintenance services: inspection and acceptance of equipment, assistance with installing new tools on overhead cranes, commissioning installations in real-time, audits, monitoring modernization projects, inspection and assistance with equipment start-up.

HIGHLIGHTS

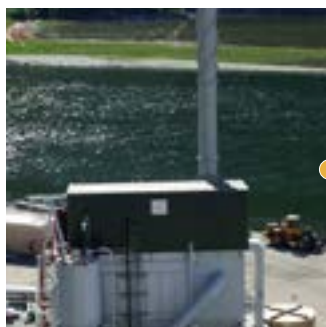


ADAPTABILITY

Remote preparation to modernize an FTC in Oman

Sohar Aluminium wanted to increase its capacity, which required a 48-hour shutdown of the Fume Treatment Center. This step was carefully prepared with several months of studies and remote monitoring, which required significant collaboration with the customer and a very inventive approach by Fives experts.

[Learn more](#)



OPTIMIZATION

Remote audit of a Pitch Fume Treatment Center

Fives environmental experts supported and trained the customer's teams to guarantee that their center runs smoothly. They worked to carry out an audit and the training requested by the customer, with the support of a local representative for measurements, general inspection and coordination.



TRAINING

New success for the Back2School training program

The 2020 edition of Back2School, organized for the first time online, brought together 175 participants from 11 different countries on a virtual platform over three days. Emirates Global Aluminium (EGA) was the exclusive sponsor. This event aimed to improve knowledge and skills on Fives Aluminium equipment.

[Learn more](#)



BAHREIN

Refurbishment of overhead cranes in Bahrain

Supported by a foundation of unique and comprehensive services dedicated to aluminium smelters in the Middle East, the teams carried out major repairs on the Pot Tending Machines, and extended their life span by 10 years. The perfect coordination between the teams, in France and Bahrain, allowed these actions to be carried out in a very short time frame.

[Learn more](#)

more

Process Technologies

ALUMINIUM



CANADA

The Fives anode baking curing technology acclaimed by customers

After engineering studies, Fives will provide a Canadian producer with equipment from its Helios solution, which allows clean and efficient combustion thanks to an optimized injection system, for a high baking homogeneity more even curing, and reduced energy consumption and emissions..

[Learn more](#)



LIFTING

Recognized expertise in all-industry lifting equipment

In Quebec, Fives modernized an overhead crane dating from 1988 and equipped with three lifting units for one of the largest paper manufacturers in the world. In Ontario, in addition to supplying five overhead cranes for several sites of a major steelmaker, Fives signed a three-year service contract covering all its plants.

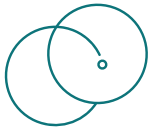
[Learn more](#)



FOCUS Using production data to optimize maintenance

The Fives Aluminium Division is fully committed to its digital transformation, to better support its customers and tackle the challenges of the pandemic. Beyond simple use of connected devices, remote assistance is also about adding value to production, which is accompanied by secure IT technologies, but also expertise thanks to access to relevant information.

Fives has established a partnership with the Trimet plant in St Jean de Maurienne to test SMARTCrane, its equipment maintenance assistance tool, which provides continual real-time data. This partnership helps deploy a custom tool which meets customer needs. Based on a network of Fives Aluminium experts worldwide, with over 200 people dedicated to the service, and Fives workshops where spare part production continued in 2020, aluminium producers were able to optimize operations and continue to produce aluminium in the best conditions.



Process Technologies



ALUMINIUM

CEMENT & MINERALS

ENERGY

STEEL & GLASS



Alain Cordonnier

Deputy General Manager, President of the Cement & Minerals Division



In a rapidly changing industrial environment (new players, new challenges), Fives has reiterated its commitment to institutions and its customers, to improve the energy and environmental performance and processes of their facilities.

The Fives Cement & Minerals Division offer ranges from design to supply and the turnkey installation of process equipment, grinding workshops and complete cement lines, plus the associated services. Fives offers technologies at the heart of the process: crushing, grinding, separation, drying, burning, filtration and processing emissions.

The COVID-19 pandemic significantly affected the cement sector from Q1 2020, leading to a 20% decline in global cement production compared to 2019. The gradual recovery of economic activities and the resistance of some markets, thanks to cement prices being maintained and the decline in costs (notably energy) helped limit the decline in global production to between -4 and -5% on average over the year. Geopolitical uncertainties and production overcapacity also failed to encourage new investments by producers which, with the exception of some regional players, have suspended or delayed their investments pending better visibility.

Alongside this, and in view of reinforced regulations to reduce the industry's carbon footprint, new investment strategies have emerged amongst cement producers to seek solutions to reduce their emissions and carbon footprint, and limit their exposure to CO₂ quotas.

That is why the Division's projects are focused on grinding workshops, notably in Central America where Fives FCB won two new contracts, equipment projects in Europe and Brazil, or clay activation projects in France.

Regarding projects in progress, teams have continued work at sites in Hidalgo and Lagunas (Mexico), Chlef (Algeria) and Portes-lès-Valence (France).

HIGHLIGHTS



MEXICO

New FCB Horomill® grinding workshop in Mexico

Already well established in Mexico, Fives won a new FCB Horomill® grinding workshop project with a regional player, which sees Fives as a top partner to continue its development in the construction materials sector.



ALGERIA

Successful commissioning of the Chlef cement plant

In early March, the new 6,000 tpd clinker production line, delivered by the Group to E.C.D.E (GICA Group), produced its first clinker; 36 hours after start-up, the kiln system, equipped with FCB Zero-Nox Preca, FCB Kiln and Pillard NovaFlam® technologies, reached nominal capacity.

[Learn more](#)



RECYCLING

Fives FCB becomes a “French Recycling Equipment Maker”

In September, the TEAM2 circular economy competitiveness cluster awarded Fives FCB the “French Recycling Equipment Maker” label. This label specifically recognized the FCB Rhodax® crusher that can be used to recover demolition concrete, and thus significantly reduce the CO₂ emissions of the cement industry.

[Learn more](#)



MODERNIZATION

FCB TSV™ Classifier separator performance recognized

Thanks to the recognized performance of its 3rd generation separator, Fives was selected by Ramco Cements to modernize its two raw grinding stations at its site in Tamil Nadu (India) and Vesuvius S.A. (Pty) Ltd to improve its coal crushing workshop in South Africa.

[Learn more](#)

Process Technologies

CEMENT & MINERALS



WCA

Fives reiterates its commitment

After joining the World Cement Association as a founding member and partner one year ago, Fives was reappointed as Vice-Chair of the “Technology and Innovation” committee, which aims to promote top technologies to support cement makers in their journey towards a more efficient and sustainable industry.

[Learn more](#)



CUSTOMER PROXIMITY

Continued support for customers during the pandemic

Over 70 maintenance projects and operations were completed in 2020. Fives has demonstrated its technical support capacities yet again:

- Local presence, as close as possible to plants,
- Remote diagnosis, with a direct link to control rooms,
- Competent and multilingual teams in all time zones.

[Learn more](#)



FOCUS

Fives commits to reducing the cement industry's carbon emissions

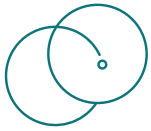
Now a major environmental issue, climate action requires a reduction in CO₂ emissions. This objective is a core priority of Fives customers, notably cement producers.

Fives' willingness to support the cement industry with eco-responsible technologies is reflected in its commitment to institutions like the European Cement Research Academy, the World Cement Association or the TEAM2 competitiveness cluster, which have made sustainable development and reduced carbon footprint their mission.

Alongside this, a significant portion of Fives R&D relates to the development of processes to reduce emissions, maximize the use of alternative fuels and produce alternative materials to traditional cement.

Fives is proud to support cement producers by proposing solutions offering the best performance in terms of product quality, energy efficiency and low CO₂ emissions: FCB Horomill® grinding workshop, clay activator, FCB Rhodax® for concrete recycling, etc.





Process Technologies



ALUMINIUM

CEMENT & MINERALS

ENERGY

STEEL & GLASS



Frédéric Thrum

Deputy General Manager, President of the Energy Division



The Energy Division has demonstrated its resilience, engagement and ingenuity to keep operating during the pandemic and fulfill its commitments. Expansion of the combustion offer in India and China via synergies is a strong area of development, as well as the digitalization of services and our advances in cryogenics and hydrogen.



Within the Energy Division, Fives designs, supplies and maintains equipment in:

- Combustion: combustion systems, burners, furnaces and flares under the names ITAS, North American and Pillard for multiple industries including cement, energy, steel, aluminium, minerals and the oil and gas industries.
- Cryogenics: heat exchangers, cool boxes and Cryomec® cryogenic pumps for gas and air separation, natural gas processing, LNG, petrochemicals and hydrogen.
- Sugar and electricity co-generation: Cail & Fletcher process lines and equipment.
- In addition to these three activities, expertise in high-tech industrial piping, Piping Solutions: engineering, manufacturing, assembly and maintenance.

Opportunities for development and growth despite the pandemic

Combustion experienced a slowdown of works on site, but it accelerated the development of solutions with lower emissions to reduce our customers' environmental footprint: Pillard NOVAFLAM® Evolution in cement, ITAS Ductflame for hot air generators and the EcoFornax™ ultra-low NOx burner range.

Cryogenics had a strong activity for exchangers and pumps, notably in Asia in the industrial gas liquefaction market. In India, Fives teams implemented a strict sanitary protocol to finish the installation of five cold boxes for the most important ethylene production capacity. It will be started up in late 2021.

The Fives Energy | Sugar business line successfully completed the delivery of process equipment for the Kristall crystallization workshop in Kirsanov, Russia.

Finally, for Piping Solutions, the activity evened out for the year with excellent performance in the general industry and nuclear sectors. 2020 also marked the launch of the «Académie Fives Nordon», a training organization focused on the metallurgy business.

HIGHLIGHTS



SAUDI ARABIA

A cold box built in record time

To meet the requirements of its customer Hyundai Engineering & Construction Co., Ltd, Fives successfully tackled the challenge of building a cold box in three months, halving the usual time frames for a project of this scale. The cold box will be the heart of a natural gas processing complex in Saudi Arabia.

[Learn more](#)



CHINA

Cryomec® pumps supplied for an air separation unit (ASU)

The contract won by Fives includes the design and commissioning of 13 centrifugal cryogenic pumps, Cryomec® LABS and Cryomec® NLL, for an ASU under construction. Located in the economic area of Lingang, China, it will be up and running in 2022 with an oxygen production capacity of over 2,000 tons per day.

[Learn more](#)

Process Technologies

ENERGY

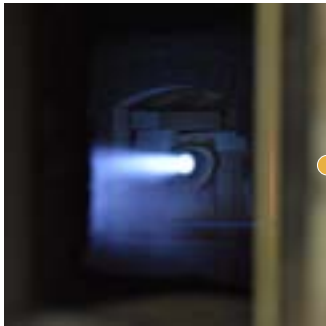


RUSSIA

The low emissions of Fives solutions make all the difference

A Spanish boiler manufacturer chose Fives for its technical solutions to limit NOx emissions and meet its expectations. Fives will equip three boilers with four dual Pillard LONoxFLAM® G2 burners each. These boilers will be installed in a petrochemical complex in Russia.

[Learn more](#)



UNITED STATES

Fives furnaces are at the heart of a steel plant

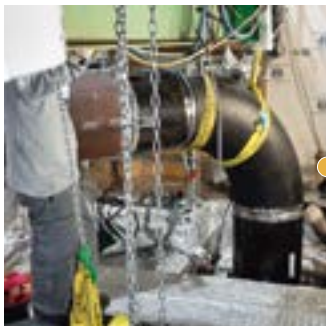
To support the growth of a major American steel provider, Fives will supply 4 car bottom furnaces, all using its North American Tempest® DMC Ultra Low NOx technology. The range of Tempest® burners is known for its exceptional temperature uniformity, and Ultra Low NOx emissions. It is adapted to a wide spectrum of industries.



THAILAND

Fives takes part in the upgrade of Kaset Phol Sugar (KSP)

For the Thai sugar producer owned by Mitsui & Co., Ltd & Mitsui Sugar Co., Ltd., Fives supplied to its Chinese partner and the project manager, Guangxi Construction Engineering Group N°1 Installation Co., Ltd, 19 FC1300HC continuous centrifugals, carried out engineering studies for six continuous vacuum pans and commissioned the equipment on site.



FRANCE

Fives successfully replaces taps at the Chinon nuclear power plant

During a nuclear power plant outage, 30 Fives employees replaced eight taps and carried out lifting operations for parts weighing up to 250 kg. Fives' intervention, which was a condition to restarting electricity production, was completed two days ahead of schedule, with the customer's congratulations.

Process Technologies

ENERGY



TRAINING

The «Académie Fives Nordon» for metallurgy business

A certified training organization, the Académie Fives Nordon supports its customers to refresh and improve their employees' skills. Training is developed and provided by Fives trainers, experts in their skill areas: welding, pipework, inspection, safety, support and anchoring, etc.

[Learn more](#)



FOCUS

Accelerating service digitalization to optimize the customer experience

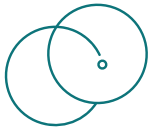
In 2020, the travel restrictions and difficulties accessing customer sites led to the widespread roll-out of remote maintenance, notably thanks to connected glasses. Webinars were organized to train local operators and remain close to customers.

The Fives Connect customer portal is now available for online ordering and payment of spare parts for Cryomec® pumps. Users can also access information on their equipment.

A new service (Fives Cryosens) was also developed to monitor and analyze heat exchanger operation and predict maintenance needs.

In Sugar, the teams continue to digitalize their services offer to optimize management of their customers' installed base.

Finally, new digital tools combining innovation, data acquisition and artificial intelligence are being deployed at Piping Solutions to improve project management.



Process Technologies



ALUMINIUM

CEMENT & MINERALS

ENERGY

STEEL & GLASS



Guillaume Mehlman

Deputy General Manager, President of Steel & Glass Division



I am proud of the fact we managed to stay our course and all we have achieved in 2020, despite the odds. We signed new contracts, delivered equipment, took care of our people in the field, and served our customers with strength, determination and resilience. I'm positive we will rebound in the steel, tube and glass sectors in the short term.

Achieving a series of firsts, despite all the odds

2020 was a year like no other for all our businesses. Despite the impediments of the pandemic, we managed to win contracts to supply new reheating furnaces to Çolakoğlu in Turkey and Cognor in Poland, as well as to revamp reheating furnaces at JSW Steel in India and at CELSA in France and Spain. An important contract for our breakthrough digital technology – intelligent integrated quality management system – was signed with AS Terni in Italy to manage product and process quality in real time.

We continued to provide our technologies for high-end markets, such as electrical motors, and were contracted to supply strip processing lines for production of highly demanding silicon steel in China.

Our tube mill orders stayed high, with contracts from all our customers in Europe and the Americas, as well as several orders for straightening machines in India.

We also secured a number of pre-engineering studies for several projects, including a float glass line in Brazil.

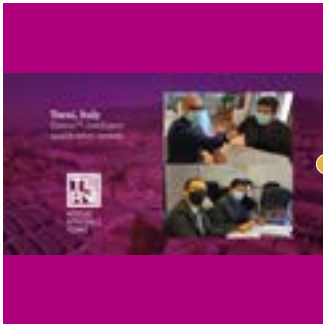
Process Technologies

STEEL & GLASS

Winning contracts in a pandemic is one thing, delivering on them is something else. We had to manage a new set of complex sanitary and mobility constraints on a daily basis. As manufacturing activities were impacted by the crisis, our supply chain teams were able to develop a number of counter-measures to ensure timely delivery of our equipment, such as those for a large-size reheating furnace in Russia, as well as tube mills and finishing equipment into the USA and Russia.

Our field engineers also commissioned two new galvanizing lines in the USA and achieved a major industrial first by putting into service our new non-oxidizing Wet FlashCooling® technology enabling the production of ultra-advanced high-strength steels. Our teams also overcame border restrictions and quarantines in order to commission a number of cold rolling mills for stainless and silicon steels in China.

HIGHLIGHTS



DIGITAL

Integrated product qualification system for stainless steel

AS Terni has entrusted Fives with a project to manage the quality within its flat production facility in Italy. Fives has proposed a digital solution – Eyeron™ – an integrated product qualification system that acquires plantwide data to assess and grade products in real time providing operators an overall view of product quality.

[Learn more](#)



UNITED STATES

First coil at SDI's new continuous galvanizing line

Fives, together with Steel Dynamics Columbus (SDI), successfully produced the first coil with a new continuous galvanizing line at their Columbus facility (Mississippi, USA). The project involved equipment delivery from several countries experiencing different forms of lockdown, namely France, Spain, Czech Republic, Italy, Mexico and the USA.

[Learn more](#)

Process Technologies

STEEL & GLASS



COLD ROLLING MILL

DMS 20Hi EcoMill to process GIGA steel at POSCO

POSCO contracted Fives for its reversible cold rolling DMS 20Hi EcoMill to process GIGA steel - Ultra Advanced High Strength Steel and TWIP. The monobloc mill design will enable the processing of the highest strength steel at wide thickness for automotive applications and will make POSCO's new mill the strongest reversible cold rolling mill ever.

[Learn more](#)

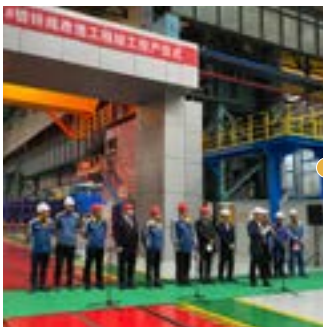


BARS AND TUBES

Orders for Bronx straighteners

An Indian state company placed several orders for Bronx straighteners to process bars and tubes at its two facilities in Telangana and Rajasthan. "They knew the name - as they have been using one of our machines since the 1980s - but what stood out to the customer is the technical advances of our machines," says Peter Clarke at Fives Bronx Ltd.

[Learn more](#)



CHINA

Commissioning of Masteel's revamped galvanizing line

Fives successfully revamped a continuous galvanizing line (CGL #1) to produce new quality coated products for construction and appliance applications. The project faced a double challenge: integration of the new furnace with a heat recovery system into the existing line and design of the specific equipment to meet new coating requirements.

[Learn more](#)



SILICON STEEL

Start-up of Xinyu's new silicon steel mill in record time

Fives designed, manufactured, supplied and commissioned in record time a DMS 20Hi cold rolling mill with an annual capacity of 100,000 tonnes to process silicon steel for a very demanding application, such as electric car motors. 79 cold tests were performed with remote assistance, while commissioning was executed just in four months.

[Learn more](#)

Process Technologies

STEEL & GLASS



FOCUS

Fives received industrial recognition as Technology Provider of the Year

Fives was honoured by Fastmarkets Global Awards for Steel Excellence, receiving industrial recognition in two categories. This prestigious acknowledgement identifies world-class innovations and excellence for companies throughout the steel industry.

Winner — Technology Provider of the Year

Fives received the award as a Technology Provider of the Year for its ground-breaking heat treatment technologies - FlashCooling®, ultra-rapid cooling for advanced high-strength steel, and CELES EcoTransFlux™, high power transverse flux induction for rapid heating cycles - as well as for a real-time quality management system Eyeron™ which provides full traceability of all process steps and quality events from the melt shop through the cold rolling and processing lines. Those technologies enable steel makers to improve operational efficiency and increase the quality of finished products.

Winner (Joint Award) — Information Technology Services Provider

As a collaborative initiative, Fives and Marcegaglia developed the SmartLine, a fully automatic strip processing line control system based on predictive modelling, which was commissioned at Marcegaglia's continuous galvanizing line in Ravenna, Italy.

[Learn more](#)



Smart Automation Solutions



Luigi RUSSO

Deputy General Manager, President of the Smart Automation Solutions Division



To support our growth, digital is crucial. We will continue to invest in the technologies of the future in 2021, as well as extend our portfolio of solutions, to transform the supply chain facilities alongside our customers.



Fives' Smart Automation Solutions Division provides smart, scalable and sustainable solutions for advanced automation, handling and sorting.

Its thorough understanding of logistics processes and the objectives of its customers, combined with leading proprietary technologies, allow Fives to support industrial companies throughout the life cycle of their facilities, from design to dismantling. With its network of over 60 service centers worldwide, the Group offers a local service for customers when carrying out their projects.

Fives' smart automation solutions serve a wide range of business sectors, from e-commerce to the manufacturing industry, including retail and Fast Moving Consumer Goods (FMCG), and even airports.

For over 60 years, Fives has developed innovative products and technologies, including some which have become market

standards. The Group continues to innovate to improve its customers' competitiveness, operators' working conditions and environmental protection.

At the heart of 'industry 4.0' plants and warehouses, Fives' management and control software optimizes logistics flows. Its digital services offer 360° monitoring for predictive maintenance; customer support becomes personalized and in real-time thanks to the Fives Connect platform.

With an order intake of nearly €670 million in 2020, up 16% on 2019, the Smart Automation Solutions Division is one of Fives' strongest growing businesses.

Driven in particular by the growth of e-commerce, it made progress in 2020 towards its strategic objectives: strengthening its digital expertise, developing its service offering, continuing its international development, particularly in the United States, and growth in the retail sector.

Smart Automation Solutions

HIGHLIGHTS



REMOTE ASSISTANCE

By our customers' side, even during lockdown

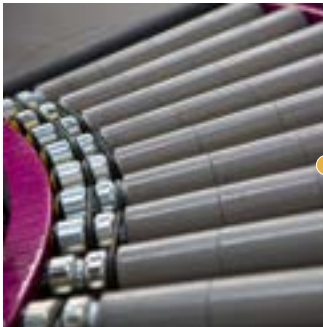
How to perform an important and urgent maintenance operation at an e-commerce warehouse during the COVID-19 lockdown? Fives responded to this request from one of its major customers in Italy, by developing an innovative solution combining digital tools and expert remote assistance.



UNITED-STATES

A crucial integrated solutions supplier

Fives has continued to expand in the United States by opening new facilities in Louisville, reinforcing its capacity to carry out integrated projects. The contract won from a leading North American postal and courier company for its new center, with a sorting capacity of 75,000 parcels per hour, is the best illustration of this.



CONVEYORS

EASY-Stream™, the next generation of conveyors

A new, unique and standardized range of conveyors, EASY-Stream™ offers excellent modularity, suitable for the widest range of applications. Improved performance, optimized maintenance, the range - produced in the new conveyor skills center in Chasse-sur-Rhône (France) - has everything it needs to win over Group customers.

[Learn more](#)



RETAIL

Optimizing retail order picking

Sorting perishable products, palletizing heterogeneous parcels, guaranteeing a warehouse supply on a daily basis... These are just some of the challenges that Fives supports its retail customers with, including a French leader who has just entrusted the Group with the automation of its order preparation platforms.

[Learn more](#)

Smart Automation Solutions



AUTOMATION

Building the plants of the future

Fives supports all types of industries in the automation of production tools, a major challenge for the factories of the future. In the wood sector, Schmidt Group has again chosen Fives, which has also confirmed its leading position in the automotive sector, with a contract for one of the largest automation projects in the industry, awarded by PSA.

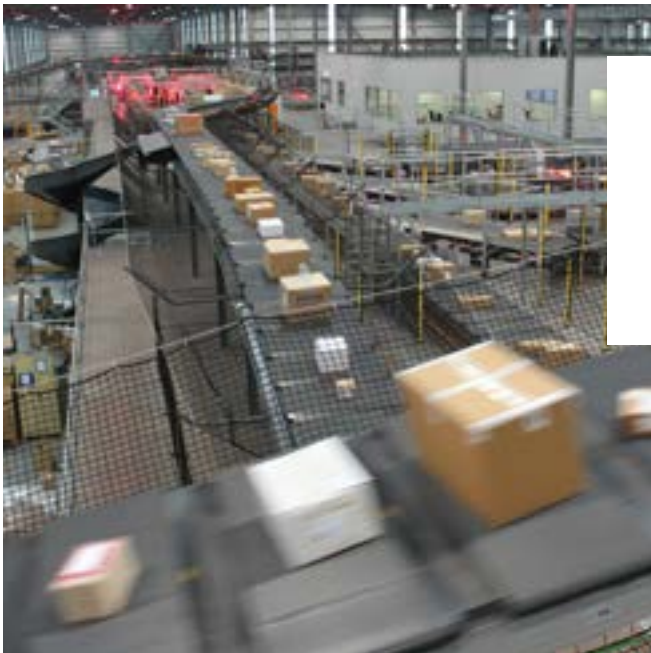


AGILITY

Solutions for a scalable and competitive handling system

To meet the growing need for automation in small logistics centers close to cities, Fives is developing ever more agile systems. After GENI-Ant, an autonomous sorting robot, the Swiveler Wheel Diverter, a key element of a scalable and competitive handling system, joined its product catalog in 2020.

[Learn more](#)



FOCUS

A record year for e-commerce

The COVID-19 pandemic has profoundly transformed consumer habits. In the context of a retail recession in 2020, online sales have boomed by nearly 30% with global turnover of €4,280 billion dollars*. Online shopping baskets were full of common consumer goods during lockdown. The boom in e-commerce promises to continue beyond the pandemic, as new shopping habits take hold and companies capitalize on investments made in this sales channel.

A partner of the main e-merchants and retailers, notably the US leader in e-commerce which has renewed its confidence in 2020 with a dozen new contracts in Japan, Europe and the United States, Fives is supporting the industry's transformations. Its scalable and high-performance systems optimize order processing. Its last-mile logistics solutions guarantee shorter delivery times, including same-day delivery.

The Group expanded its geographical footprint in 2020, with contracts for JD.Com in China and for a Russian e-commerce giant.

[Learn more](#)

* "Global Ecommerce Update 2021" report, E-Marketer

Transversal activities



Martin Duverne
Deputy Chief Executive Officer

The combination of the industry expertise of Fives' Maintenance teams and our innovative digital technologies make the Group a key partner in the performance of industrial companies.

Mastering maintenance activities for various markets

Fives' teams specializing in industrial maintenance work with their customers through output based contracts, ensuring their equipment achieves optimal performance. As most services are provided on site, in 2020 Fives experienced a slowdown in Maintenance activity in the aerospace industry, but was able to maintain it in the defense sector. The teams also supported the growth of their logistics customers, including in the midst of lockdown.

Fives also focused on the tenders for three of its biggest customers, whose answers concerning the renewal of their contracts will be known in 2021. Alongside this, the Maintenance teams also explored new opportunities to continue diversifying their customer and market portfolio.

Data supporting industrial performance

Fives CortX offers its customers tailored solutions which combine artificial intelligence, data expertise and knowledge of industrial processes and machinery.

In 2020, the teams worked to reinforce the security of their data processing and collection solutions, thus addressing a major challenge of industry. They formed a partnership with WALLIX, a European specialist in cybersecurity, whose WALLIX

Inside solution is part of the CortX Gateway to continue securing different data streams "by design". To support its growth and welcome future employees, Fives CortX also moved to more spacious facilities, which have on-site test resources. Finally, Fives CortX provided its expertise in industrial vision to other Group Subsidiaries for quality-related problems.

Transversal activities

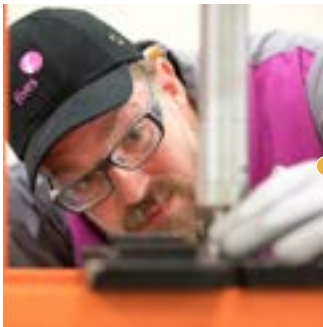
HIGHLIGHTS



MAINTENANCE

A hand-held maintenance diagnosis tool

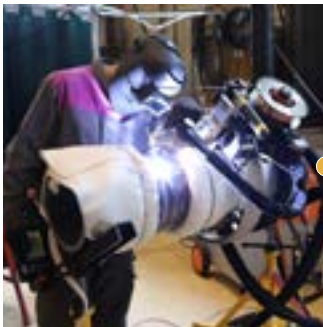
Fives has developed a diagnostics kit for temporary monitoring of equipment. Easy to deploy and compatible with all industrial sensors, it includes data processing and acquisition solutions and can be used for diagnostics or to detect machine faults.



MAINTENANCE

Fives starts up two new contracts in aeronautics

Fives relied on its Maintenance teams to simultaneously kick off these contracts during lockdown in France. The services include maintenance of automated assembly lines, lifting methods and tools, including those used during ground testing of aircraft electrical equipment for Final Assembly Lines.



PREDICTIVE

A solution to optimize welding traceability and quality

Detecting a welding fault at a given moment to save time, improve quality and ensure traceability? It's possible with *Nordon Soudage Prédictif*. This solution allows transparent welding and for welds to be repaired directly, if needed, and not at the end of the project, to avoid material waste and potential delays.

Transversal activities



FOCUS

An ecosystem of multi-industry experts to optimize our solutions

Fives is a founding member of La Ruche Industrielle, a group of industrial companies and technology partners which collaborate on specific use cases at factories to offer solutions adapted to the increasingly complex needs of operational workers.

Two subjects are the focus of experiments: vision, to provide an “in process” quality control, and smart supervision, to offer relevant indicators directly on the machine to allow production and maintenance to make informed decisions.

Thanks to this collaboration, Fives can check that the solutions are suitable with potential users and test new approaches, particularly artificial intelligence, on shared lab test methods, as close as possible to use cases reported in the field.

Fives was able to experiment with new functionalities on its Gateway connected to a test bench, including the option to remotely operate and configure different control components installed in the equipment. The use of a perfectly secure connection opens up a range of possibilities.

Environment



Frédéric Sanchez
Chairman and Chief Executive Officer

Fives teams have always endeavored to devise the most efficient solutions and make a difference to their customers' environmental performance. The incorporation of climate issues into the Group's innovation strategy reflects our 'Industry can do it' commitment, alongside our customers.



Fives is a key figure in the low-carbon transition: primarily as a committed and accountable company, the Group works to reduce its own environmental footprint. And above all thanks to its solutions, which help reduce the environmental impact of industry, which represents 18% of global CO₂ emissions (Source: AIE, 2018 data).

KEY FIGURES

118 Gwh
Group energy consumption

80%
of sites ISO 14001 certified

44
industrial sites

The solutions developed by Fives allow industrial companies to adopt an energy saving approach. They help to develop the circular economy, the use of hydrogen, electrification of industrial processes, and thus encourage the saving of energy and raw materials. These solutions are broadly based on digital technologies.

Environment



FOCUS

Hydrogen, another part of the energy transition puzzle?

Greater energy efficiency and a reduction of greenhouse gas emissions, urban pollution and dependency on fossil fuels are essential, and a new solution has emerged: hydrogen, which can help address the challenges of clean transport.

Currently, hydrogen is mostly produced from fossil fuels, using processes which emit large amounts of CO₂, but “green” hydrogen can be produced from zero-carbon electricity (mainly water electrolysis).

The technologies are now mature enough to allow wide-scale production, with the support of ambitious national programs. The sector is rapidly organizing itself and growing. Its development will require the involvement of strong industrial figures, able to design and supply suitable equipment, as well as innovative and digitalized production lines with extremely high standards in terms of quality. Fives has entered this market, which could make use of numerous Group activities and expertise, whether hydrogen production, storage or transport technologies, or the use of hydrogen for transport.

Environment

In 2020, the Group prepared to develop a Group Climate strategy, which will be defined based on a carbon assessment carried out in 2021. It will cover reducing energy consumption at its own sites, and promoting the environmental benefits of the solutions which Fives develops for its customers. Fives is also working to reduce CO₂ emissions linked to the supply chain, and to increase the share of energy consumed from decarbonized energies.

With this in mind, the Group has approached the Solar Impulse Foundation to propose some of its products, so that they can be assessed as a “Solar Impulse Efficient Solution”. Early 2021, four Fives technologies have already been awarded this label. Like Fives, the Foundation shares the vision of an industry which does its bit to solve the problem of climate change. Its founder Bertrand Piccard launched the “1,000 solutions” challenge: industrial technologies which contribute to environmental protection, while remaining profitable.

3 answers with the Solar Impulse Foundation

1. What is the origin of the «1000 efficient solutions challenge» of the Solar Impulse Foundation?

We chose the target of 1000 because we needed a large number of solutions to prove our point that clean and profitable Solutions already exist. By finding 1000 already feasible, profitable, and sustainable solutions, we can demonstrate that the future is already in our hands.

2. The industry is usually seen as the problem. What can make them also part of the solution?

The Solar Impulse Foundation works with companies that are seeking or providing solutions that improve or replace polluting technologies with cleaner ones, while being profitable for the company and for clients. By investing in clean technologies, promoting green R&D and more, industry is part of the movement to tackle the environmental crisis.

3. You're already reached the number of 939 labeled solutions. How far will it go? How will you bring this momentum further?

The momentum will keep going, moving into the second phase of our project: encouraging governments and industries to implement these labelled Solutions. We can only do this based on a strong portfolio of Solutions that can respond to the most pressing environmental problems. However, reaching the 1000 mark does not mean that we will stop seeking more Solutions. Rather, it is a moment to recognize the wealth of ingenious spirit around us. We like to say it is only a layover, before taking another courageous leap towards the transition to a clean and profitable future.



fives

Industry can do it