

Business Report

Key figures 2019	p. 4
Our Corporation	p. 8
GF Piping Systems	p. 9
GF Casting Solutions	p. 13
GF Machining Solutions	p. 18
Our employees	p. 23
Company strategy	p. 29
Letter to the shareholders	p. 32
Highlights	p. 39
Sustainability at GF	p. 44
Organization of GF	p. 53
Success Stories	p. 57
GF Piping Systems	p. 57
GF Casting Solutions	p. 63
GF Machining Solutions	p. 68

Key figures 2019

Sales

in CHF million

3'720

2019



2018



2017



EBIT

in CHF million

235

2019



2018



2017



EBIT margin

in %

6.3

2019



2018



2017



**EBIT
before one-offs**
in CHF million

281

2019



2018



2017



**EBIT margin
before one-offs**
in %

7.6

2019



2018



2017



**Net profit after
minorities**
in CHF million

173

2019



2018



2017



ROIC

in %

12.4

2019



2018



2017

**Earnings per share**

in CHF

42

2019



2018



2017

**Free cash flow****before acquisitions/ divestments**

in CHF million

137

2019



2018



2017

**Number of employees****14'678**

2019



2018



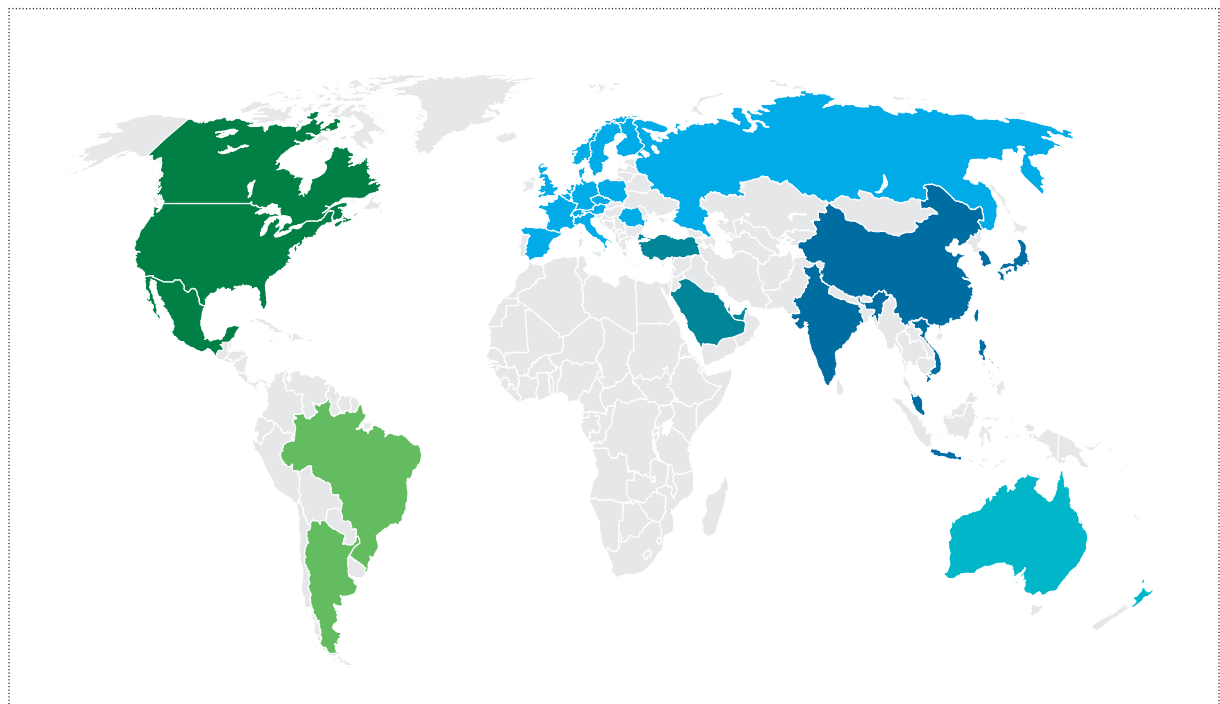
2017



	Corporation		GF Piping Systems		GF Casting Solutions		GF Machining Solutions	
CHF million	2019	2018	2019	2018	2019	2018	2019	2018
Order intake	3'692	4'521	1'788	1'865	953	1'617	954	1'042
Orders on hand at year-end	563	623	119	134	267	289	177	200
Sales	3'720	4'572	1'802	1'821	949	1'687	972	1'066
Sales growth %	-18.6	10.2	-1.0	8.5	-43.7	13.8	-8.8	7.5
Organic growth %	-4.1	6.5	1.3	8.2	-9.7	5.2	-7.5	5.4
EBITDA	374	529	264	269	48	160	71	102
EBIT before one-offs	281	382	214	217	22	86	57	88
One-offs	46				46			
EBIT	235	382	214	217	-24	86	57	88
Net profit after minorities	173	281						
Free cash flow before acquisitions/divestments	137	147						
Return on sales before one-offs (EBIT margin before one-offs) %	7.6	8.4	11.9	11.9	2.3	5.1	5.9	8.3
Return on sales (EBIT margin) %	6.3	8.4	11.9	11.9	-2.5	5.1	5.9	8.3
Invested capital (IC)	1'473	1'494	676	688	477	531	256	262
Return on invested capital (ROIC) %	12.4	22.4	26.1	27.2	-4.4	16.1	18.4	27.5
Number of employees	14'678	15'027	6'892	6'852	4'336	4'693	3'358	3'394

Our Corporation

GF comprises three divisions: GF Piping Systems, GF Casting Solutions, and GF Machining Solutions. Founded in 1802, the Corporation is headquartered in Switzerland and present in 33 countries with 142 companies, 56 of them production facilities. Its 14'678 employees generated sales of CHF 3'720 million in 2019. GF is the preferred partner of its customers for the safe transport of liquids and gases, lightweight casting components, and high-precision manufacturing technologies.



North America 20 Locations

South America 3 Locations

Asia 68 Locations

Europe 79 Locations

Middle East 13 Locations

Oceania 6 Locations

Find all places of GF at:

annual-report.georgfischer.com/19/en/our-corporation-2019/



GF Piping Systems at a glance

GF Piping Systems is a leading supplier of piping systems made of plastics and metal. The division focuses on system solutions and high-quality components for the safe transport of water, chemicals and gases, as well as corresponding services. The product portfolio of fittings, valves, pipes, automation and jointing technologies covers all applications of the water cycle.

Global presence

GF Piping Systems supports customers in the fields of utility, industry, and building technology in over 100 countries through its own sales companies and representative offices. The division operates more than 30 production sites in Europe, Asia, and the Americas.

Key figures

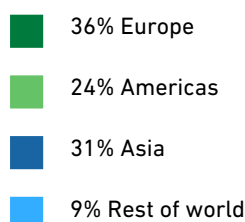
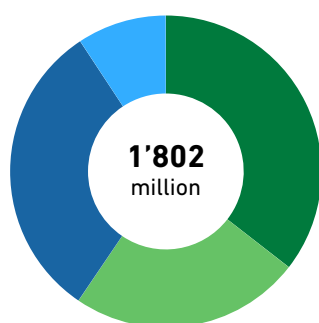
CHF million	2019	2018
Order intake	1'788	1'865
Orders on hand at year-end	119	134
Sales	1'802	1'821
Sales growth %	-1.0	8.5
Organic growth %	1.3	8.2
EBITDA	264	269
EBIT	214	217
Return on sales (EBIT margin) %	11.9	11.9
Invested capital (IC)	676	688
Return on invested capital (ROIC) %	26.1	27.2
Number of employees	6'892	6'852

Employees

6'892

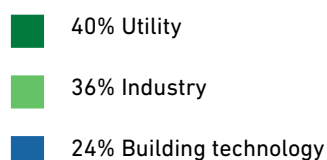
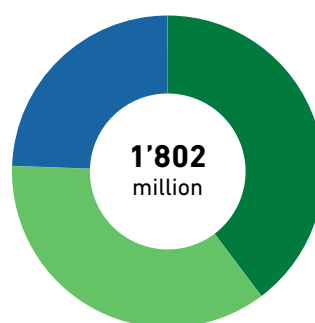
Sales per region

in CHF



Sales per segment

in CHF





Groundbreaking customer solutions

GF Piping Systems sees digitalization as a key pillar in developing innovative products and solutions for its customers. The Hycleen Automation System is an excellent example of this and the drive to accelerate the development of pioneering technologies.



The showcase solution

The Hycleen Automation System prevents harmful bacteria from multiplying in the piping installation, and ensures perfect drinking water quality. This is a revolution for water installations in hotels, hospitals, and residential buildings, as well in the marine segment. Hycleen ensures safe water supply and the automated operation of drinking water installations. The state-of-the-art circulation control system is quick to install and operate. It allows all customer data to be logged, evaluated, and displayed. Hycleen offers GF Piping Systems exciting growth opportunities worldwide.



Strategy 2020 recap

The key pillars of GF Piping Systems' strategy are strengthening the existing market segment organization, linking the innovation process to identified customer needs, expanding the global presence and adapting the footprint, as well as shifting portfolio towards higher margin businesses and services. GF Piping Systems is well on track in the implementation of these thrusts.



Innovation strategy

Customer centric innovation is essential for the future differentiation of GF Piping Systems. To further increase its competitive advantages, the division's innovation initiatives depend on listening to and quickly acting upon customer needs. The innovation strategy is built on four core elements:

- Empower all regions to innovate
- Open organization for internal and external collaboration
- Focus on strategic innovation fields
- Improve learning culture and decision making velocity



GF Casting Solutions at a glance

GF Casting Solutions is one of the leading solution providers of lightweight components in the mobility and energy industry. As a future-oriented company, GF Casting Solutions acts as a driving force for innovation in the foundry and additive manufacturing world and wants to take the lead in shaping the development of sustainable mobility.

Global presence

GF Casting Solutions manufactures at 13 production sites in Germany, Austria, Romania, Switzerland, China, and the USA. The division supplies the global automotive industry, aerospace and energy markets, and provides components for off-highway vehicles as well as for industrial applications.

Key figures

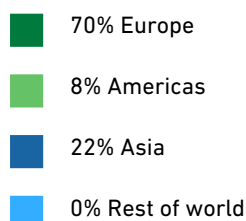
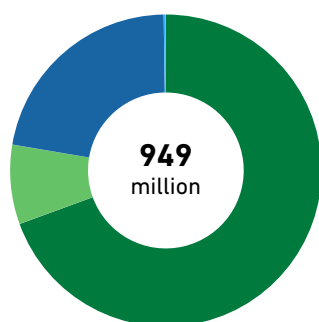
CHF million	2019	2018
Order intake	953	1'617
Orders on hand at year-end	267	289
Sales	949	1'687
Sales growth %	-43.7	13.8
Organic growth %	-9.7	5.2
EBITDA	48	160
EBIT before one-offs	22	86
One-offs	46	
EBIT	-24	86
Return on sales before one-offs (EBIT margin before one-offs) %	2.3	5.1
Return on sales (EBIT margin) %	-2.5	5.1
Invested capital (IC)	477	531
Return on invested capital (ROIC) %	-4.4	16.1
Number of employees	4'336	4'693

Employees

4'336

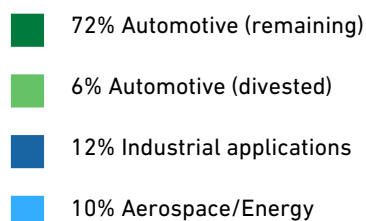
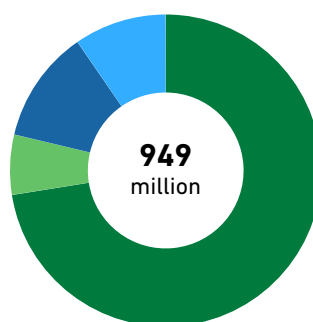
Sales per region

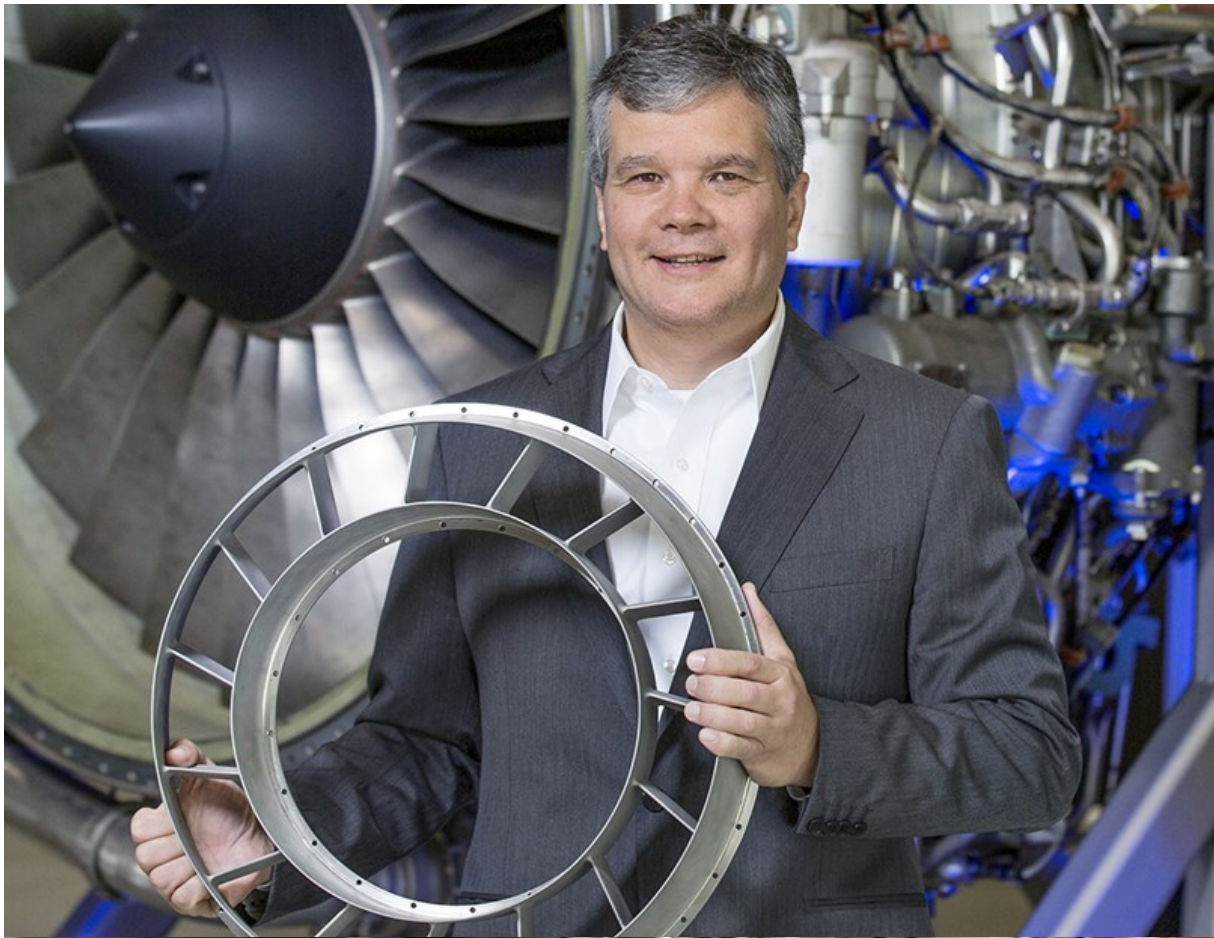
in CHF



Sales per segment

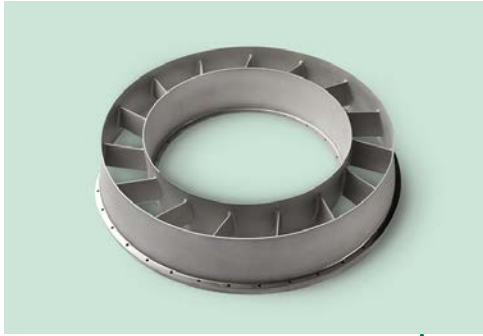
in CHF





Driving future technologies

GF Casting Solutions is a leading manufacturer of cast and additive manufactured components. With innovative products like the Turbine Rear Vane for aero engines, which is manufactured using an additive process, the division makes revolutionary steps in the aerospace industry.



The showcase product

It is about saving time, gaining design freedom, and reaching all quality standards: The new Turbine Rear Vane (TRV) represents the Additive Manufacturing portfolio of GF. This complex part – one of the largest additive components ever manufactured for an aircraft turbine – is printed within only 48 hours. The TRV is manufactured in a combination of GF technologies in the new “**AMotion Center**” in Stabio (Switzerland), led by GF Casting Solutions and GF Machining Solutions. The combination of 3D printing and the new horizontal EDM technology – provided by GF Machining Solutions – is unique in the additive manufacturing world.



Innovation strategy

GF Casting Solutions keeps the focus on operational excellence and innovation for the mobility of the future in mind – in its strategic segments automotive, aerospace, off-highway, and energy. The division strives for making mobility more sustainable through innovative lightweight design, the use of new materials and new processes for lighter and consequently more fuel-efficient components. Key customer pains are the reduction of CO₂-emissions and fuel consumption. Through GF's lightweight design and cast solutions, customers can be continuously supported from the first concept to ready-to-mount components, systems, and modules.



Strategy 2020 recap

Key pillars of GF Casting Solutions' strategy are the expansion into higher margin businesses, provide global solutions, and ensure profitability in Europe. In these fields, the division has taken important steps: The promising aerospace and energy segments have been expanded successively. In line with the trend towards lighter vehicles, the division focussed on its competences in lightweight components made of aluminum and magnesium. The divestment of the sites in Singen and Mettmann (Germany) and Herzogenburg (Austria) completed the withdrawal from the automotive iron casting business in Europe.



GF Machining Solutions at a glance

GF Machining Solutions is one of the world's leading providers of complete solutions to the tool and mold making industry and to manufacturers of precision components. The portfolio includes Milling, wire-cutting, and die-sinking EDM machines. Moreover, the division offers Spindles, Laser texturing, Laser micromachining, Additive Manufacturing, Tooling and Automation, as well as digitalization solutions.

Global presence

GF Machining Solutions is present in more than 50 countries with its own sales companies. The key customer segments are the aerospace, Information and Communication Technology (ICT), electronic, medical, and automotive industries.

Key figures

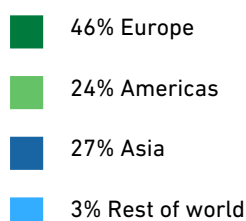
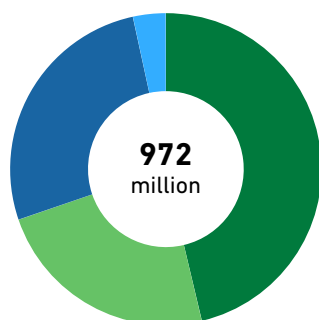
CHF million	2019	2018
Order intake	954	1'042
Orders on hand at year-end	177	200
Sales	972	1'066
Sales growth %	-8.8	7.5
Organic growth %	-7.5	5.4
EBITDA	71	102
EBIT	57	88
Return on sales (EBIT margin) %	5.9	8.3
Invested capital (IC)	256	262
Return on invested capital (ROIC) %	18.4	27.5
Number of employees	3'358	3'394

Employees

3'358

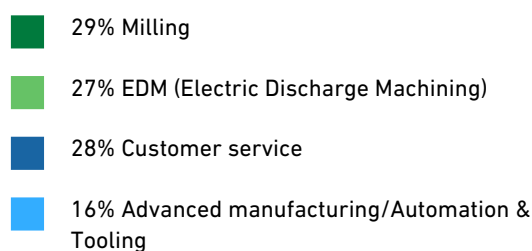
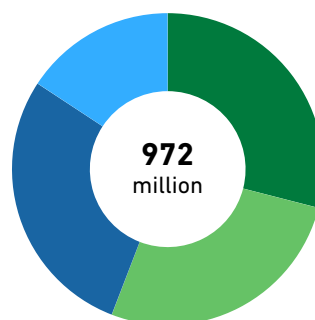
Sales per region

in CHF



Sales per segment

in CHF





Focus on digitalization

GF Machining Solutions develops new digital solutions and highly precise machines. The EDM, Milling, Laser and advanced manufacturing technologies strengthen the division's role as innovation partner.



The showcase product

One of the innovative solutions shown by GF Machining Solutions at the world-leading machine tool fair “EMO” 2019 was the new AgieCharmilles CUT P 550 Pro. This new wire Electrical Discharge Machine (EDM), to be officially launched in 2020, offers a new human-machine interface, which ensures a higher flexibility and simplifies tasks such as programming or changing the machining strategy. Moreover, it also features GF Machining Solutions’ revolutionary Spark Track technology. Thanks to that, the Fir Tree Disk, a part of an aero engine, can be manufactured more precisely.



Innovation Strategy

GF Machining Solutions continued to be strongly focused on technologies and services that are currently gaining momentum: Additive Manufacturing (AM) and Intelligent Manufacturing. Together with its partner 3D Systems, GF Machining Solutions offers an optimized and integrated metal AM workflow, easier factory Automation, as well as dedicated post-processing solutions such as Milling and EDM. In terms of Intelligent Manufacturing – which adds great value to customers – the division is already deploying the infrastructure for the future using edge computing and digital hubs while building up its service platform at the same time. Software solutions like rConnect offer customers a fast, digital overview of their production and provide them with access to expert service, wherever they are.



Strategy 2020 recap

By 2020, GF Machining Solutions will be the trusted partner of the global precision machining industry during all phases of the lifecycle. Key pillars of GF Machining Solutions' strategy are ensuring professional and efficient organization, providing complete solutions, and keeping its innovation leadership characterized by Swiss quality.



Our employees

Motivated employees are crucial to the success of a company. GF relies on the commitment of its employees. To promote their engagement, GF offers various perspectives and opportunities for their development.

Company Culture

Cultivating shared values

As an internationally operating company, GF employs 14'678 staff worldwide in 33 different countries from several cultures and ethnic groups. GF welcomes employee diversity as a valuable source of creativity and innovation. In order to create a common basis for global cooperation, GF has defined five corporate values (see box below). They form the foundation of the corporate culture and are taught to employees in training courses. In this way, GF creates a culture of mutual respect and cultivates an atmosphere of openness, trust and team spirit.

Five values of corporate culture

- We put customers first
- We act fast
- We do what we say
- We reward performance
- We respect people

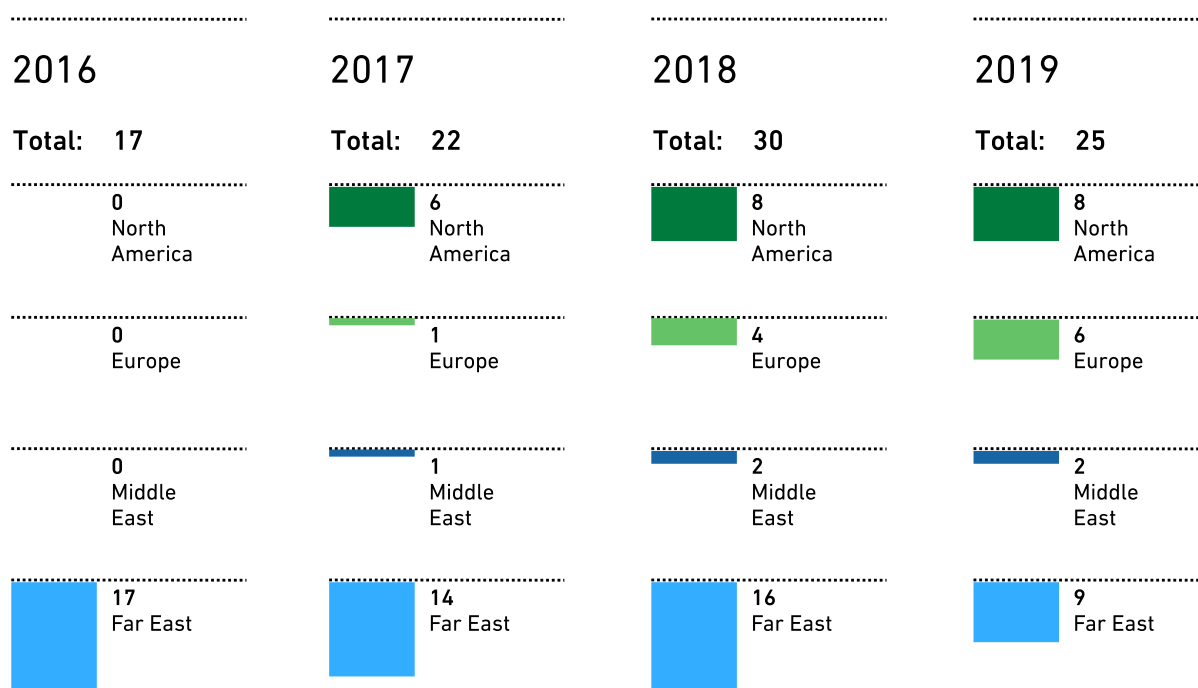


<https://www.georgfischer.com/en/about-gf/sustainability-at-gf/values.html>

Beyond borders

At GF, employees have the opportunity to acquire professional and life experience in different cultural environments over the course of their careers. GF encourages the exchange of exceptionally talented employees across national and cultural borders. Expats and inpats are able to gain the skills necessary to assume global responsibilities within the company and acquire an understanding of other cultures, customs and traditions.

Long-term international assignments per year and region



Modern working environment

Attractive employer

Promoting employees and job satisfaction is a high priority throughout GF. In addition to offering modern employment conditions, GF focuses on providing an innovative working environment that strengthen open communication and efficient cooperation, while still making it possible for employees to withdraw on their own to do concentrated work. Last year, GF invested in modern workplaces in Romania, Japan, and at its Swiss sites in Biel and Schaffhausen.

Compensation & Talent Management

Fair compensation models

GF applies the same four principles of compensation to the Board of Directors, Executive Committee and all employees. Compensation should be fair and transparent, performance-related, long-term oriented and in line with the market. To this end, GF works with modern function evaluation models that permit internal and external comparisons. These models take into account factors such as experience, responsibility and competences. GF attaches great importance to avoiding any form of salary discrimination.

Promoting skills and expertise

For employees at management level, GF follows the Management by Objectives (MbO) approach. Annual targets are set in a target agreement at the beginning of the year, and target achievement is monitored over the course of the year by both the employee and its manager. This process is designed to promote employees' skills and competencies and strengthen their sense of personal responsibility.

Finding highly qualified talents

GF attaches great importance to the search for up-and-coming talents. GF participates in professional and student fairs around the world to introduce itself to students and graduates of universities and applied science universities as a modern employer offering attractive career prospects. Students also have the chance to get to know GF better as a potential employer at a number of different events.

GF works with universities and technical colleges around the world, including China. Students have the opportunity to do internships or to write their bachelor's or master's theses (BA or MA) within the framework of challenging GF projects or case studies. GF maintains partnerships with top technical universities in Switzerland, Germany, Austria, and Australia. New cooperations have been established with the Harvey Mudd University in Southern California (USA) and the University of Lugano (Switzerland).

Education at GF

Training our own specialists

GF employs 446 apprentices worldwide, giving them the opportunity to launch their careers within a global company. A good example is the trainee program especially developed in 2017 for technical customer service at GF Machining Solutions in Lincolnshire, Illinois (USA). This initiative has met with a strong positive response, as the USA does not have an officially recognized apprenticeship system like in Switzerland and other European countries.



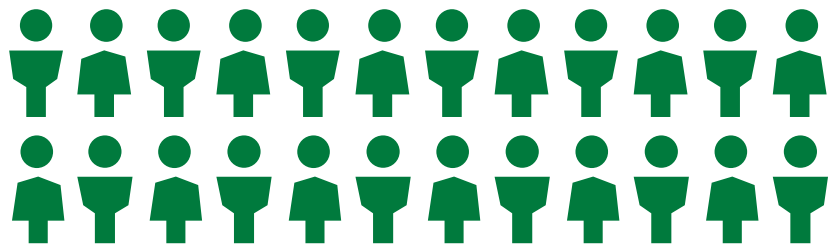
Design Thinking training in Schaffhausen for employees from all over the world.

GF supports and promotes its employees throughout their careers through targeted development and training programs. The GF Academy formulates the company-wide range of training measures and programs and is responsible for their implementation. The offerings address employees from all divisions and regions and are aimed at supporting them in acquiring and further developing professional and social skills. For 15 years now, all new employees have been introduced to Stephen Covey's "Seven habits of highly effective people" (nicknamed the "7 habits") in a training course. The 4DX method (4 Disciplines of Execution) teaches employees important skills that help them successfully implement the corporate strategy. The topic of innovation is to be promoted through regular training sessions on "Design Thinking."

Employee trainings at GF 2019

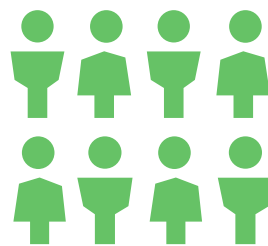
7 Habits
(46 trainings
worldwide)

806 Total
participants
2019



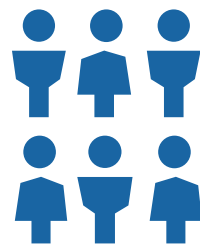
Design Thinking
(21 trainings
worldwide)

266 Total
participants
2019



4DX
(23 trainings
worldwide)

193 Total
participants
2019



Women at GF

GF wants to increase the proportion of women in management positions. Two women hold appointments to the Board of Directors, the company's highest management level. When filling vacant management positions, where internal candidates are usually preferred, attention is paid to include at least one woman on the shortlist. Women are also increasingly occupying line management functions. To help enable female employees to continue their careers, for several years now, GF in Switzerland has voluntarily granted all expectant mothers a job guarantee of twelve months from the date of birth in a comparable position, which exceeds the requirements of the collective employment agreement. In other countries, GF is also endeavoring to find economically viable and sensible solutions along these lines, taking legal frameworks into account.



Company strategy

GF is a worldwide business player operating in an environment of global competition. All three divisions of GF are among the market and technology leaders in their segments and main markets.

Vision & Strategy

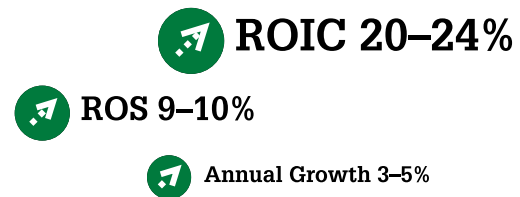
GF is a global industrial company and leading solution provider. It generates value throughout the economic cycle. All three divisions GF Piping Systems, GF Casting Solutions, and GF Machining Solutions are among the market and technology leaders in their segments and main markets.



The Strategy 2020 focuses on profitable growth.

The strategic objectives are

- + ROIC 20–24%
- + ROS 9–10%
- + Annual Growth 3–5%



In order to achieve these objectives, the strategy is implemented on the basis of three main strategic thrusts:

- + Widen presence in growth markets, adapt portfolio & footprint in Europe
- + Shift divisions' portfolio to higher margin businesses
- + Drive sales proficiency and innovation excellence

GF addresses the challenges of global megatrends and offers dedicated solutions in all three divisions – in line with Strategy 2020.

Global trends 1 – Growing and aging world population, urbanization

GF's solutions in the segments Utility, Industry and Building technology:

- + Leak-free and safe delivery of water and gas outside buildings (Utility)
- + Energy efficient process water solutions for various industries (Industry)
- + Hygienic water for private homes and commercial buildings (Building technology)

Global trends 2 – Climate change and CO₂-reduction, urbanization, mobility

GF's solutions in the segments automotive and aerospace:

- + Planning, development, and digital production know-how for the production of lightweight components
- + Precision casting and Additive Manufacturing know-how for the aerospace and energy segment

Global trends 3 – Digitalization & miniaturization, increased need for precision

GF's solutions for making high-precision machines more energy efficient:

- + Additive Manufacturing (more complex, lighter products, reduced scraps)
- + Intelligent Manufacturing (full traceability, better and faster maintenance)
- + Laser texturing and Laser drilling (more aesthetic and functional texturing)



Letter to the shareholders

GF Piping Systems with strong performance – economic headwinds affect overall results

Dear shareholders,

The geopolitical uncertainties affected the global economy in the first half of 2019 and have become even more evident in the second semester of the year. The trade tensions between USA and China, the lengthy Brexit discussions, ongoing confrontations in the Middle East region and in particular, the transformational change in the automotive business led to economic headwinds. As a consequence, the business sentiment in key industries and markets was affected by these uncertainties, creating a more challenging environment for GF.

GF sales amounted to CHF 3'720 million (2018: CHF 4'572 million), a decline of 18.6%. The development was primarily due to the proactive withdrawal of GF Casting Solutions from the iron casting activities in the European automotive industry and negative currency effects of CHF 88 million. Organically, sales decreased by 4.1%. The organic decline in the second half of the year decelerated to 2.5% versus a 5.5% decrease in the first semester 2019. Whilst GF Piping Systems grew organically by 1.3%, sales of GF Casting Solutions and GF Machining Solutions organically decreased by 9.7% and 7.5% respectively. GF increased the top line in the Americas, whereas markets in Europe and Asia recorded a lower sales volume.

The operating result (EBIT) amounted to CHF 281 million before one-off items compared to CHF 382 million in 2018, equal to an EBIT margin (ROS) of 7.6% (2018: 8.4%). Including one-off items amounting to CHF 46 million in connection with initiated structural adjustments of GF Casting Solutions, the EBIT was CHF 235 million (EBIT margin 6.3%).

The return on invested capital (ROIC) reached 12.4%. GF Piping Systems achieved a remarkable ROIC figure of 26.1%. As a result of the divestment at GF Casting Solutions, the number of employees at year-end fell to 14'678 (2018: 15'027).

GF's net profit after minorities amounted to CHF 173 million (2018: CHF 281 million). The free cash flow before acquisitions reached CHF 137 million, which is CHF 10 million below previous year's level. Earnings per share reached CHF 42 compared to CHF 69 in 2018. The Board of Directors will propose at the upcoming Annual Shareholders' Meeting a dividend per share of CHF 25 on strong previous year's level. GF is well positioned in its markets and the focus on less cyclical market segments has increased the resilience of GF to economic slowdowns. These efforts will be pursued in the years to come.

GF Piping Systems

GF Piping Systems grew by 1.3% organically and was able to keep its sales at CHF 1'802 million on previous year's level. Headwinds from currency movements affected sales negatively by CHF 45 million. All three business segments Utility, Industry and Building Technology showed a strong performance in Europe, whereas the Asian and the US markets suffered from the ongoing trade tensions. China was slightly below previous year's level, since major infrastructure projects such as the "coal to gas program" continue to remain on hold.

The operating result stood at CHF 214 million (2018: CHF 217 million), for a strong 11.9% ROS, at the level of previous year. The continuous shift to higher value businesses with more digitalized solutions bears its fruits. The demand for clean water solutions remains on a high level, the pre-insulated Cool-Fit product line, developed for the transport of cooling media, experienced high growth and strong demand for datacenter projects and from other industrial customers.

**The continuous shift
to higher value
businesses with more
digitalized solutions
bears its fruits.**

The new high-pressure die casting facility from GF Linamar in the US is well positioned with its manufacturing capabilities for lightweight structural components.

GF Casting Solutions

In 2019, the performance of GF Casting Solutions was impacted mainly by the structural changes and market turmoil in the European automotive industry. In order to ensure the competitiveness in this new environment, the division has been swiftly implementing comprehensive structural and operating measures. The iron foundry divestment in Herzogenburg (Austria) with negative one-time costs of CHF 9 million and the partial relocation of the site in Werdohl (Germany) with costs of CHF 37 million led to overall one-off costs of CHF 46 million for 2019.

The new high-pressure die casting facility from GF Linamar in the US is well positioned with its manufacturing capabilities for lightweight structural components. The company was awarded with several large orders. The high order book required already an expansion of the operations, which was accomplished in June 2019. Consequently, the ramp-up costs for the new orders had a considerable impact on the result and amounted to CHF 16 million for the full year 2019. Adjusted for divestments (CHF 633 million), sales fell organically by 9.7% to CHF 949 million. The significant drop of the automotive production in Germany (–7%) and China (–8%) is the main driver for the organic decline. The operating result before one-off items dropped as a consequence to CHF 22 million (2018: CHF 86 million), resulting in a ROS of 2.3%. Including one-off items amounting to CHF 46 million in connection with initiated structural adjustments, the EBIT was CHF –24 million (EBIT margin –2.5%).

The strategic transformation, including the optimization of the footprint in Europe and the shift in new market segments such as aerospace and energy, is on track. The completion of this transformation is expected in 2021.

GF Machining Solutions

In the second half-year 2019, the demand for capital goods in Europe, spearheaded by Germany, but also in the US dropped. The Chinese markets for machine tools remained on previous year's low level.

GF Machining Solutions generated sales of CHF 972 million, an organic decline of 7.5% compared to the previous year. Businesses in China and Western Europe have been impacted the most, whereas the division was even able to grow in the US, based on the division's strong position in aerospace and medical technology. Innovations and a strong focus on the defined strategic market segments allowed the division to clearly outperform the North American market.

The reduction in sales and the lower utilization of production capacities affected the operating result. It fell from CHF 88 million to CHF 57 million, resulting in a ROS of 5.9% compared to a strong 8.3% in 2018.

Innovations in the field of new technologies such as laser texturing or additive manufacturing continued to see a high demand from our customers, growing 41% in 2019.

The ramp-up of the new milling innovation and production center in Biel/Bienne (Switzerland) has been successfully accomplished. The focus on operational excellence and innovation will remain the main driver for the development of the division.

Innovations and a strong focus on the defined strategic market segments allowed the division to clearly outperform the North American market.

Last year of strategy 2020 cycle / outlook

In the last year of its strategy cycle 2016–2020, GF will continue to focus on the implementation of its strategic thrusts and the acceleration of the strategic transformation at GF Casting Solutions. The structural shift within the automotive industry from traditional powertrain systems to hybrid and e-mobility concepts shows that the focus on lightweight structural components and parts for the energy and aerospace sector are the right moves. However, the transformation of the division is an ongoing part of the strategy and is anticipated to be finished in the year 2021. GF Piping Systems will continue to shift its portfolio to higher value businesses. The broad global customer base and the focus on sustainable solutions resulted in a strong performance despite difficult market conditions. Innovations and solutions for the safe transport of liquids and gases will remain the key focus of the division. At the world-leading machine tool fair EMO, GF Machining Solutions launched new digitalized solutions preparing the ground for further growth. The division's passion for customer-centric innovations remains the key driver for growth and profitability.

The economic and political uncertainties in the markets, including the operational and financial implications of the coronavirus, have grown and will most probably continue in the upcoming months. In 2020, GF will therefore strengthen its focus on innovation, speed and operational excellence and has proactively launched an agility program addressing these topics. These initiatives in the transition year 2020 will set a solid base for the new GF strategy cycle 2025. They will complement the initiated structural measures with the ambition to sustainably improve future results and thereby bring GF's performance back towards its strategic targets (EBIT margin 9–10%, ROIC 20–24%).

Changes to the Board of Directors

Yves Serra will be proposed to the shareholders at the Annual Shareholders' Meeting on 15 April 2020 for election as Chairman of the Board of Directors. From 2008 to 2019, Yves Serra has been President and CEO of GF. Upon his retirement as CEO, he was elected to the Board of Directors and nominated as Vice Chairman.

Roman Boutellier has reached the age limit and will retire as a Board Member at the next Annual Shareholders' Meeting. With his broad industrial, technological and scientific background, Roman Boutellier has contributed significantly to the successful development of GF over many years. We would like to thank him for his countless, very valuable and inspiring contributions he made to our company. The Board of Directors proposes Peter Hackel, CFO and Member of the Group Executive Management Board of Straumann Ltd, Basel (Switzerland) as new Board Member.

Mutual trust as key success factor

Our heartfelt thanks goes to all GF employees worldwide for their customer-centric efforts, team spirit and passion for GF. They will become even more an important key success factor for GF in the future.

Our customers are an ongoing source for inspiration and for generating new ideas. We are grateful for their support, their appreciation but also their constructive criticism. We also thank all our shareholders whose number has been increasing significantly over the last years, for their trust, as well as our banks for supporting GF over many years in all financial matters.



Andreas Koopmann
Chairman of the Board of Directors



Andreas Müller
CEO

After ten years of service on the Board of Directors, of which eight years as Chairman, Andreas Koopmann has decided not to stand for re-election at the 2020 Annual Shareholders' Meeting. Andreas Koopmann has always led our Board in an open, competent and farsighted manner and has been a highly appreciated sparring partner for the CEO and the Executive Committee. Throughout his tenure, GF has benefited from his wealth of operational experience as well as from his valuable insights as Board Member in major listed companies. The Board of Directors and the Executive Committee of GF address their heartfelt thanks to Andreas Koopmann for his outstanding services on behalf of the Corporation.



Yves Serra
Vice Chairman of the Board of Directors

Highlights 2019

2019 was an active year for GF, characterized by successfully completed projects, site openings, as well as major events organized by highly motivated employees.



<https://youtu.be/7DNHvCAeEMc>

1/2019

Shared competencies

GF pools its expertise in additive manufacturing in order to leverage its unique position on the market. A competence center established for this purpose has been operating since January under the name “**AMotion Center**” in Stabio (Switzerland) and is managed by GF Casting Solutions and GF Machining Solutions. The center has been successfully audited to obtain the NADCAP certificate, the highest possible level of certification in the aerospace industry. With the additive manufacturing process, highly complex components can be produced using metallic 3D printing.



4/2019

Newly formed GF Executive Committee

At the Annual Shareholders' Meeting on 17 April 2019, two changes took place in the **GF Executive Committee** (from left to right: Pascal Boillat, Carlos Vasto, Andreas Müller, Joost Geginat, Mads Joergensen): CFO Andreas Müller took over the position of CEO from Yves Serra, who has reached retirement age. Mads Joergensen, who served as CFO of GF Piping Systems for many years, became the new CFO of GF. Yves Serra was elected to the Board of Directors at the Meeting.



5/2019

A significant anniversary

GF's own “Iron Library” (Eisenbibliothek) celebrated its **70th anniversary** in spring this year. It was founded on 31 December 1948 on the initiative of Ernst Müller, Director of GF at that time. The Iron Library in Klostersgut Paradies, near Schaffhausen (Switzerland), is dedicated to preserving the cultural and historical heritage of GF, together with the Corporate Archives. It is one of the world's largest specialist libraries for the history of iron and steel as well as the history of technology in general.



7/2019

For the mobility of the future

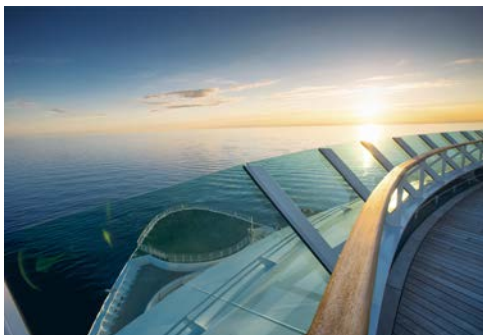
If Tesla and SpaceX founder Elon Musk has his way, in future people will be transported around the globe at breathtaking speed. At the Hyperloop competition in Los Angeles (USA), among the many participants the **Swissloop team of the ETH Zurich** (Switzerland) showed how this vision could be realized with a transport capsule. GF, as a main sponsor of the Swissloop team, supplied the team with a casting component, developed by GF Casting Solutions, to cool the pod's drive system. During the competition in July, the transport capsule reached an impressive top-speed of 252 km/h in the vacuum tube - rushing straight to the 2nd place.



7/2019

Strengthen competitiveness in Europe

In 2019, GF has swiftly undertaken actions to ensure its competitiveness in Europe and decided in July to shift approximately 300 jobs from the location in Werdohl (Germany) to Romania and Austria. The light metal casting plant in Werdohl has suffered from the changing market conditions and the shift by customers in their range of products. As part of the strategic focusing of its portfolio, in October, GF Casting Solutions divested its iron foundry in Herzogenburg (Austria) to the company MRB FerCon GmbH which was founded by former GF managers. GF thus completed its withdrawal from the automotive iron casting business in Europe, which had already been announced in December 2018, in line with GF's strategy.



8/2019

Expand presence in the marine business

In August, GF Piping Systems acquired Global Supply Co. Inc. in Hallandale (USA), a company specialized in services for the shipping industry, for example retrofitting cruise ships. This acquisition will allow the division to expand its presence in the promising US marine sector.



9/2019

Investments at several sites

GF invested around CHF 100 million in the new innovation and production center of GF Machining Solutions in Biel (Switzerland). The divisional headquarters, opened in September, offers space for around 450 workplaces and has more than 13'000 m² available for production and assembly (pictures 1 and 2). After about two years, in October, GF Casting Solutions opened a new administration building in Pitești (Romania) for about 40 employees. GF Piping Systems inaugurated its modernized headquarters and the new customer training center in Schaffhausen (Switzerland) in November (picture 3). Within the same month, GF Casting Solutions celebrated the inauguration of the new **Tool Technology and Manufacturing Center** (picture 4) in Souzhou (China).



9/2019

Half a million Swiss francs for clean drinking water

More than 1'000 GF employees and business partners from the USA (pictures 1 and 4), Germany, Indonesia, and Switzerland (pictures 2 and 3) took part in GF's "Walk for Water" in September. The charity run brought in donations of around CHF 350'000, which GF topped up to CHF 500'000. This amount was donated to the "Water Mission" aid organization, a long-standing partner of GF. The money will be used for projects in Indonesia and Malawi.



<https://youtu.be/GRMuJVzRI2U>

9/2019

Capital Market Day well visited

With the motto "Innovations for today and tomorrow", GF gave about 50 analysts and journalists in Biel (Switzerland) an in-depth insight into current innovative projects geared to sustainability and efficiency on the **Capital Market Day** in September. With various exhibits, the three divisions presented their latest applications in the areas of water hygiene, lightweight vehicle and engine components, as well as the additive production of complex and lighter products.



<https://youtu.be/m58vDOxdKy4>

11/2019

Joint venture in the Middle East

In November, GF established a joint venture with Corys Investments LLC in Dubai (UAE) and Egypt Gas, Cairo (Egypt). The new company Egypt Gas GF Corys Piping Systems will invest in a new production facility for plastic pipes and fittings near Cairo. It aims to participate in the rapidly growing market for gas and water distribution in Egypt. The start of commercial production is planned for 2021.



Sustainability at GF

In an increasingly complex and uncertain world, it is becoming more critical for companies to focus on broad stakeholder value to achieve business success. Therefore, it is the aim of GF to ensure that its business positively contributes to society's progress toward being future-fit.

GF regards ethical business conduct, resource-efficient and environmentally friendly production, eco-design in products and solutions, as well as respect for its employees and all other GF stakeholders as part of the Corporation's responsibility in society.

Our stakeholders

GF maintains a continuous dialogue with its internal and external stakeholders, enabling key issues to be proactively recognized and addressed. This exchange is promoted through a wide range of activities and measures.



Employees

At the end of 2019, GF proudly employed 14'678 people at locations in 33 countries around the world.

Investors

GF is in regular contact with its investors via roadshows, events, meetings (including the Annual Shareholders' Meeting of the Corporation), or through active participation in annual assessments of the company by sustainability analysts.



Customers

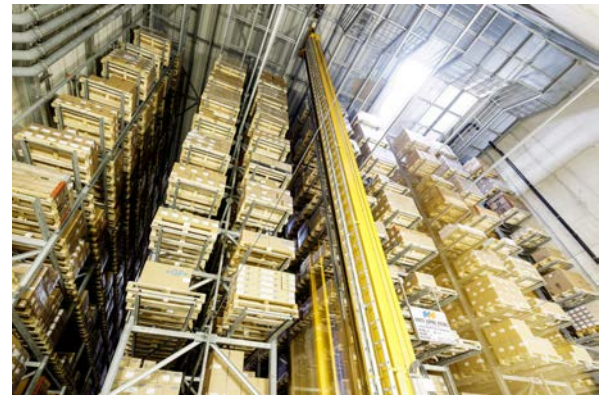
Lasting customer loyalty is built by GF's product and solutions specialists maintaining ongoing contact with customers and by GF taking part in a variety of trade fairs, organizing in-house events, as well as customized training sessions for GF's customers.

In addition, targeted workshops on sustainability are held with customers from key market segments in order to jointly develop future-oriented products, solutions, and services.

Suppliers

Long-term successful partnerships with GF's procurement and logistics partners are essential for the continuity of the business. Ensuring that they represent and follow the standards that GF applies to itself is of the highest importance to GF.

GF also sees suppliers as crucial collaboration partners to ensure increased environmental efficiency of GF's own operations (e.g. in the case of production equipment) as well as reducing possible social or environmental risks for GF's value chain.



Universities and research institutes

GF maintains close contact with universities and research institutes. Cooperation takes place on a number of levels, both in specific projects and in the provision by GF of internship and diploma work opportunities to students of technical colleges and universities.



Regulators

For GF as an international company, it is crucial to stay abreast of and follow the relevant rules and regulations of each country in which it operates. To facilitate this, GF is a member of a number of chambers of commerce.



Local communities

GF supports and promotes cultural and social programs at its various locations, as well as aims to create an overall positive impact on the local communities where it operates.

Media and general public

GF regularly publishes media releases on relevant topics and maintains a continuous exchange of information with journalists. Traditional media conferences are supplemented by the active presence of GF on the social media channels [Twitter](#), [Facebook](#), [YouTube](#), [LinkedIn](#) and [Xing](#).



Industry associations and NGOs

As an international company with Swiss roots, GF cultivates an ongoing exchange with international and national associations and organizations. From Swiss trade associations to organizations active on the international level to global networks such as the UN Global Compact – GF is involved in many ways.

GF is committed to sustainable corporate development. The Corporation takes economic, ecological, and social responsibility for its activities at all levels. To focus the necessary efforts, GF conducts a periodic materiality assessment of topics within the area of its influence to identify those that carry highest relevance for GF and its key stakeholders. Based on this process, GF puts in place measures necessary to continuously advance its standing on these topics.

Sustainability program management

Responsibility for continuous integration of sustainability aspects into the daily operations of GF lie with each department and division. The topic is coordinated at the Corporate level by the Corporate Sustainability unit¹ in close contact with the dedicated sustainability teams within the three divisions to ensure tracking of the progress of individual locations, business units, and divisions towards achieving the set targets.

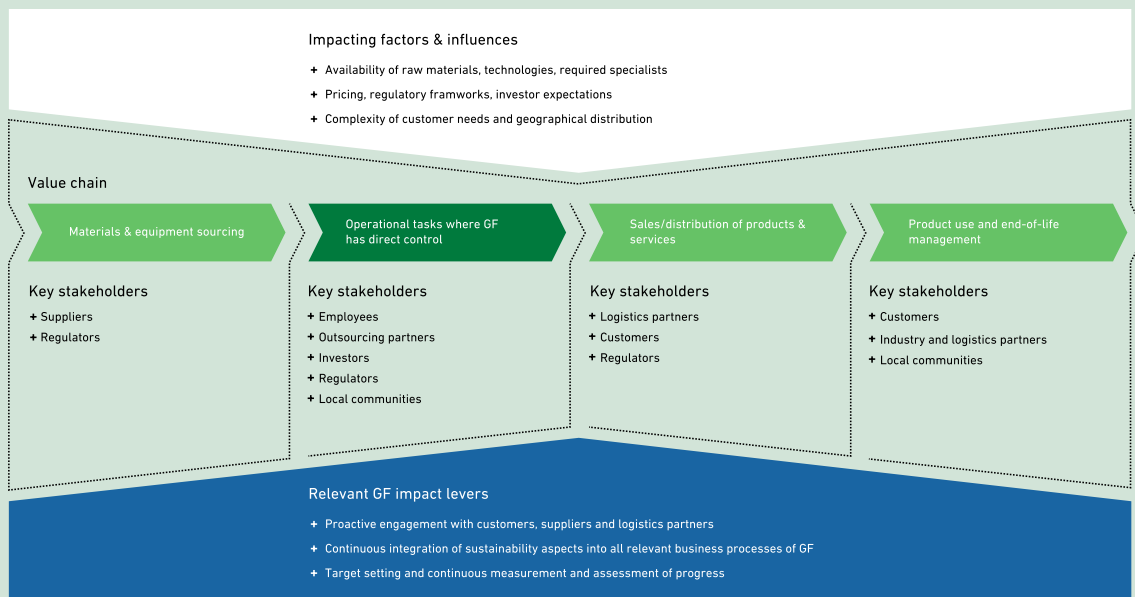
Evaluation of **sustainability risks**, including possible climate-related exposure, forms part of GF's Risk Enterprise Process, with assessment by the business units conducted on a half-annual basis.

The Executive Committee bears the ultimate responsibility for the topic of sustainability and for ensuring that the defined targets are met with progress discussed every six months. The annual performance objectives of the Executive Committee Members include at least one related to sustainability. The specific points match and support the strategic efforts of each division and are being cascaded into the organization.

-----> MBO process at GF

Specific sustainability-relevant measures that the Corporation and its three divisions are currently working on are based on the set of **Sustainability Targets 2020** defined in 2015 along the entire value chain of GF. These targets are closely linked with GF's Strategy 2020, and the respective activities contribute to the key strategic thrusts of the Corporation. Being now almost at the end of the current 5-year strategy period, GF could show progress on all of the set sustainability goals. Detailed information will be published at mid-year in the Sustainability Report 2019.

Value chain of GF at a glance



GF brings sustainability to its customers

In GF's core business, sustainability efforts are directly linked to the Corporation's understanding of its purpose – to add value to and improve the quality of lives through all of GF's business endeavors. Thus, GF aims to ensure that the components or full-system solutions that it designs and produces address the megatrends facing today's society, contribute to the UN Sustainable Development Goals, and provide best value-added from both quality, safety, and sustainability angles for the customers of its divisions.



Pressurized piping system for the transport of water, gas and multiple industrial pressure applications.

For **GF Casting Solutions**, considerations for sustainability in its product portfolio mean developing the solutions for the future of mobility, both in automotive and aerospace segments. The core expertise of the division is in applying innovative design solutions and production technologies to create components with weight reduction of up to over 50%² – thus helping its customers to reduce fuel consumption and respective CO₂-emissions during the vehicle's usage.

For **GF Piping Systems**, sustainability means, amongst others, leak-free and safe delivery of water, gas, and chemicals to the utility sector, energy-efficient process water solutions for industrial applications, as well as hygienic water for private homes and commercial buildings. As one of the many projects implemented in 2019, GF Piping Systems could win a contract to install 760 km of water pipes in Brazil to help the local municipality to reduce water loss in the network – expected annual savings of 75 billion liters of water.



E-Engine housing for alternative drive solutions.



GF's Microlution machines can be used to produce high-precision components, for example for engines with gasoline direct injection.

For **GF Machining Solutions**, sustainability means providing customers with modern, high-precision machines and solutions that significantly improve the energy efficiency of product manufacturing, and offering new technologies. An example thereof is the production of nozzles for gasoline direct injection (GDI) engines – high-precision parts manufactured on GF's Microlution machines. The nozzles produced using the Femto Laser technology, enable savings of over 15% of gasoline during vehicle usage and assure compliance to ever-tighter car emission regulations.

Communication about Sustainability

As a fundamental step to further anchor the topic into daily activities of GF, the internal policy on sustainability management at GF was brought up-to-date and published in the summer of 2019. A variety of channels were added for communication to and with the GF employees on the topic of sustainability – through a global quarterly sustainability newsletter, in-person thematic events, and an online collaboration group. In the fall of this year, continuing an annual tradition, GF conducted a regional sustainability conference, bringing together over 30 environmental and Health & Safety specialists from GF's Asian locations.

Planning for the future

Preparing for the new business strategy cycle, a project was launched in the summer of 2019 to define the sustainability framework for the years 2021–2025 and a longer-term ambition level (2030+) on sustainability. Dialogue with GF's key stakeholder groups formed part of this process, and input of customers and suppliers of the three divisions, as well as of GF's investors and employees was collected in a series of interviews.

Anchored in the social environment

In accordance with its fundamental values, GF supports and promotes cultural and social programs at its various locations as well as activities that contribute to the common good. In 2019, around CHF 2 million were spent at the Corporation level on social involvement activities. The biggest contributions in 2019 went to the Corporation-owned foundations Klostergut Paradies, Iron Library, and Clean Water. In addition to this, several GF companies supported local activities by making substantial contributions.

GF is a member of various Swiss and international business associations with annual membership fees in the amount of less than CHF 0.1 million. In the year under review, no contributions were made to any political parties or to individual politicians.

70 years of the Iron Library Foundation

The Iron Library in Schlatt (Switzerland) is owned by GF since 1918. The Iron Library Foundation was established in December 1948. Today, GF proudly owns one of the world's largest private collections of books on the subject of iron and industrialization. In 2019, the Foundation celebrated its 70th birthday with a special exhibition "From Convent to Cloud" and further activities.

Improved access to clean drinking water

Through its Clean Water Foundation, GF has supported a total of 151 drinking water projects worldwide since 2002. To date, GF has invested more than CHF 10 million and has improved the lives of more than 300'000 people with better access to safe drinking water. In the context of this Corporate commitment, more than 1'000 GF employees and business partners in four countries took part in the GF "Walk for Water" at the end of September 2019. The event attracted donations of CHF 350'000. GF rounded up this amount to CHF 500'000 and donated it to the non-profit organization "Water Mission" in Charleston (USA), a trusted partner of GF's Foundation for the past 10 years. The funds mainly support selected clean water projects in Indonesia and Malawi.

¹ Positioned within the CFO organization and reports to the Head of Corporate Controlling and Investor Relations

² As compared to applying sheet metal technology



Organization of GF

Georg Fischer Ltd, the Holding Company of the GF Corporation, is organized under Swiss law. It is headquartered in Schaffhausen (Switzerland), and listed on the SIX Swiss Exchange.

Board of Directors

The seven to nine members of the Board of Directors are elected individually by the Annual Shareholders' Meeting. The Board of Directors has ultimate responsibility for supervising and monitoring the management of Georg Fischer Ltd. It decides on the company strategy and organizational structure, the organization of finance and accounting, the annual budget and the investment budget. Also it appoints the members of the Executive Committee, to which it transfers the operational management of the Corporation. All members of the Board of Directors are non-executive, eight are also considered independent based on the Swiss Code of Best Practice for Corporate Governance of Economiesuisse.

Executive Committee

The Chief Executive Officer (CEO) is responsible for the management of the Corporation. Under his leadership, the Executive Committee addresses all issues of relevance to the Corporation, takes decisions within its remit, and submits proposals to the Board of Directors.

Corporate structure

GF Corporation is organized in the three divisions GF Piping Systems, GF Casting Solutions, GF Machining Solutions, and the two Corporate Staff Units Finance & Controlling and Corporate Development. The Presidents of the divisions and the Corporate Staff Units are responsible for managing their businesses and for achieving their business objectives.

Corporate Center

The CEO and the CFO form the management of the Corporate Center, which is closely involved in management, planning, IT, communications, finance, management development and corporate culture. The Corporate Center ensures also that risk management, transparency, governance, sustainability, and compliance practices meet the requirements of the owners and the public, and it supports the Board of Directors in meeting its responsibilities.

Finance

Corporate Finance & Controlling uses state-of-the-art information systems to ensure the time-critical financial management of the Corporation. A standardized system of financial reporting is used throughout the entire Corporation, guaranteeing immediate and complete transparency. Currency, interest rate, and credit risks are monitored and managed at Corporation level.

Management development

Strategically important competencies and information are shared and made available throughout the Corporation. Considerable importance is attached to internal training, talent management and to putting the best possible people in management positions. Up to 70% of all senior management positions are filled with internal candidates.

Communication

The Corporation has a strong brand with GF, which has been built up and strengthened consistently over many years. The Corporation builds confidence in its products and services with an open and active communication policy to customers, employees, media, analysts, shareholders, and other stakeholders.

Corporate values

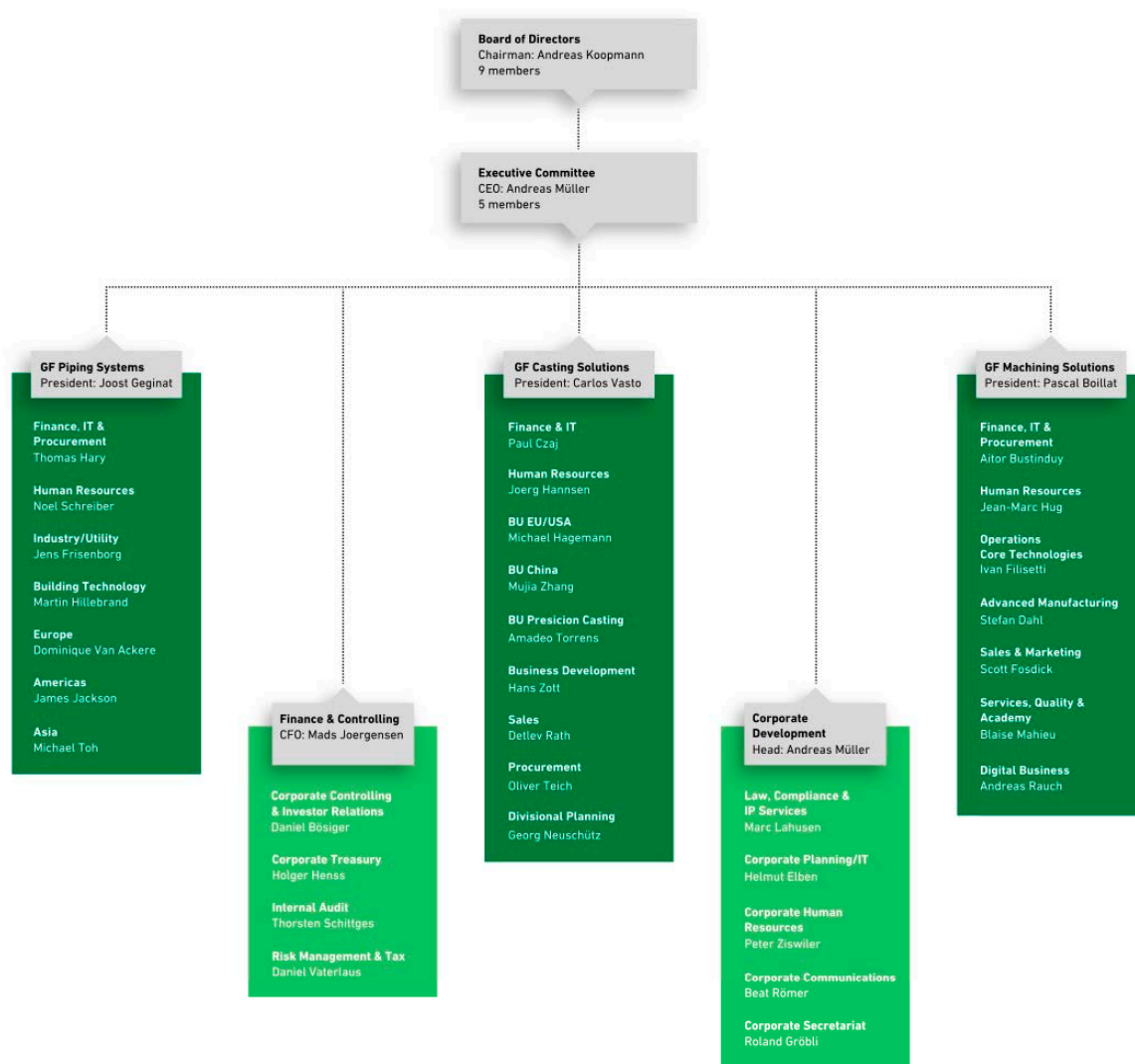
The sustainable development of the Corporation is supported by shared corporate values. They are put down in writing in the Code of Conduct and are becoming increasingly important with the spread of globalization.

Corporate Governance

For detailed information on Corporate Governance see the same named chapter.

GF organization structure

As of 31 December 2019





Sustainable support for California

In many regions of this world, water is a luxury, although it shouldn't be. For around 50 years, the British company Biwater has been working to provide clean water and wastewater treatment with over 25'000 projects in more than 90 countries. GF Piping Systems cooperated with the Californian Biwater subsidiary in the construction of a modern water treatment plant in Pico Rivera (USA).

It's only a 60 kilometer drive from Los Angeles to Rancho Cucamonga, California (USA). The 175'000-inhabitant city is well known as an important industrial site in steel production and it is home of the North American headquarters of Biwater Inc, a subsidiary of the British company Biwater International.

The company works for industrial and municipal clients and delivers advanced treatment systems that provide safe, reliable and energy efficient water desalination or reuse systems with low life cycle costs. Treated water is an important topic – especially for California, where severe droughts are a recurring problem. Therefore, more than a decade ago, the Water Replenishment District of Southern California (WRD) – the largest groundwater agency in the State of California, managing and protecting local groundwater resources for four million residents – announced a program for Southern California to become 100% independent of imported water in the future. Therefore, a new advanced water treatment facility was needed. The plant in Pico Rivera has been built with the expert support of GF Piping Systems. It is one of many projects by WRD to manage the replenishment of groundwater in the Los Angeles central basin. The plant helps to reduce reliance on imported water from the environmentally sensitive mountain lakes and rivers in Northern California and the drought-stricken Colorado River.

A strong partner nearby

"We chose to work with GF Piping Systems because we were looking for a partner with a proven track record, a well-known company with proven products," says Aaron O'Donnell, Senior Vice President Engineering of Biwater Inc. The geographical proximity was also an important factor for close and easy collaboration: GF has a site in Irvine, only about 60 kilometers from Biwater's headquarters in Rancho Cucamonga. From Irvine, the GF Piping Systems team supplies hundreds of different customers in different markets like microelectronics, life science, food and beverage and water treatment – an ideal starting point also for the Biwater project. The Irvine location has expertise in the production of high-density polyethylene (HDPE) pipe and fittings used for the conveyance of liquids needed for the Biwater construction in Pico Rivera.



<https://youtu.be/e00YXPd6IRw>

From theory to practice

Biwater started with the first plans as early as 2013, with GF Piping Systems joining in May 2017 during the early design and concept phase. "Our products and expertise played a central role until the plant was completed," says Scott Stringfellow, Area Sales Manager of GF Piping Systems in Irvine. "As we are specialists in HDPE components, we were responsible for the design, manufacture and pre-fabrication of custom components including the unique manifolds critical to the system's successful operation. Our engineering team analyzed the plant requirements and created custom components to be utilized in the water treatment system in CAD, later to be assembled in our fabrication facilities in Irvine." He added: "The offsite fabrication allowed Biwater to take delivery of pre-assembled components, which saved labor and time during construction." The order from Biwater included custom-made pipe and manifolds that form the heart of the ultrafiltration and reverse osmosis system at the Pico Rivera plant. But of course, in such a big project, things don't always go smoothly – and "especially then speed and flexibility are of utmost importance. Our teams went the extra mile to ensure immediate supply of the newly fabricated assemblies. Biwater recognized this customer service and ability to act fast," Scott Stringfellow says. The hard work was worth it.

Aaron O'Donnell and Scott Stringfellow are already planning further joint projects. The focus will be on water treatment and groundwater replenishment again. "All interactions with Biwater and Aaron have evolved from a business relationship to a very close working relationship, which helps projects go smoothly for all involved," says Scott Stringfellow describing the atmosphere between the two companies. Good prospects for the joint projects!



What is reverse osmosis (RO)?

RO is a water purification process that uses a partially permeable membrane to remove ions, unwanted molecules, and larger particles from drinking water.

“We chose GF Piping Systems because we were looking for a partner with a proven track record.”

Aaron O'Donnell, Senior Vice President Engineering Biwater Inc



The plant in Pico Rivera

The plant forms a cornerstone of a suite of projects by the client Water Replenishment District to manage the replenishment of groundwater in the Los Angeles central basin. It helps to reduce reliance on imported water from the environmentally-sensitive mountain lakes and rivers in Northern California and the drought-stricken Colorado River. Treated wastewater that would otherwise be wasted to the ocean, to the concern of biologists and environmentalists, is purified to an extremely high standard and then delivered to nearby spreading fields where it percolates into the local aquifer. This water migrates over weeks to local ground water wells used to extract water as the feed source for the areas water treatment plants. This process replaces potable water resources that would otherwise require importation from outside the region. As the external resources are plagued with occasional droughts and demand is surpassing natural replenishment, this water is not always sufficiently available, and costs rocket. Thereby, indirect potable reuse from wastewater resources, is a locally sustainable alternative to imported water in Southern California.

“We really appreciated the efforts of the GF team throughout the design, delivery, and commissioning.”

How would you describe your experience with GF Piping Systems?

The communication with our partners at GF Piping Systems was excellent. They always responded quickly and professionally – especially when it came to solving emerging problems promptly.

What challenging moments do you remember, where GF could support you?

Because of the complex construction of the system, we needed innovative ways to customize the design to reduce the installation time of the various header components. Both the product range and the material expertise of GF Piping Systems proved invaluable. Our contacts at GF suggested a solution with the reliable electrofusion joint, which worked very well.

What do you appreciate about GF products?

The products' quality and durability are extremely high, as the product is an essential component of the systems we manufacture and bears our name. The products provided by GF meet our expectations in terms of function and reliability. It is clear that they are manufactured to a very high-quality standard.



Interview with Aaron O'Donnell

Aaron O'Donnell is Senior Vice President Engineering at Biwater Inc



Taking the fast lane

Electric car manufacturers in China need suppliers with strong Research & Development capabilities and great operational efficiency. GF Casting Solutions has both. Through its successful partnership with emerging carmaker Aiyas, the division demonstrated that a global company can be a great partner for a startup in the Chinese market.

China's auto sector has been cooling down, but it is still one of the fastest growing markets for electric cars. In the first half of 2019, about 490'000 electric cars were sold in China, a 56.6% increase from last year, according to the China Association of Automobile Manufacturers.

Aiways is one of the emerging carmakers trying to tap into the growing pie. The startup recently launched its first electric SUV called U5, with a reach of up to 503 kilometers. The SUV is equipped with six lightweight structural parts (two front shock towers and four torque boxes) produced by GF Casting Solutions. The aluminum components were developed and produced in less than 12 months.

“Global player with extensive experience”

The GF parts are crucial for Aiways due to their light weight and consequently because they make the electric car more energy efficient. That's why the carmaker looked precisely into potential suppliers, one of them GF Casting Solutions. Aiways' chief casting expert, Wang Xuefeng, says: “GF Casting Solutions won the contract after a six-month evaluation period for its wholesome capabilities to help design these innovative products.” That was the start of a profitable partnership with Aiways.

The even more important reason for choosing GF Casting Solutions was that the team demonstrated great efficiency in working with startups. An example: Both sides had started exploring manufacturing methods together, even before the designs were frozen. Together they were able to complete the trial production of five dies within five months, which was a strong support to the debugging process of Aiways' production lines. “GF is a global player with extensive experience working with carmakers around the world. It meets our requirements entirely and has done quite a few prospective researches, which has proved to be very helpful to us,” says Wang Dongchen, Chief Technology Officer of Aiways.

Daniel Hu, Sales Director China of GF Casting Solutions, agrees: “The partnership is successful because both sides put great value on commitment and efficiency. The GF team was passionate to meet Aiways' tight schedule. A close and professional collaboration between the Aiways and GF team was a prerequisite to succeed.”



<https://youtu.be/22X3C9picnA>

Many growth opportunities

In past years, government subsidies played an important role in promoting the growth of China's electric mobility market. Today, as politicians start to tighten monetary support, the industry is entering a phase of consolidation.

Despite taking a more cautious stance, China will continue to encourage the development of new electric cars because of environmental challenges predominantly in large cities. According to a guidance policy issued by China's top politicians in 2017, by 2025, new electric cars will account for 20% of new car sales in the country, which translates to at least 4 million cars every year – more than twice the number in 2018. Whereas the share of electric vehicles in Europe is expected to be at 9%, according to a recent projection by JP Morgan.

Compared with established automotive brands, electric car manufacturers need much more development support from suppliers, says Steffen Dekoj, Head of R&D Asia of GF Casting Solutions. "If you have enough resources and R&D capabilities, you definitely have a bigger advantage over low-cost, pure casting suppliers." For example, Dekoj says, GF Casting Solutions is using a unique design approach called Bionic Design during the R&D process, which, compared to traditional sheet metal design, contributes to a weight reduction of up to 45% of car body components, successfully meeting clients' goals to reduce emissions and create more sustainable cars.

"GF is a global player with extensive experience working with carmakers around the world."

Wang Dongchen, Aiways' Chief Technology Officer

"There are currently 18 employees working in GF Casting Solutions' Asia R&D center, which collaborates closely with the colleagues at the R&D headquarters in Schaffhausen," says Dekoj. "We do most of the work locally in China, and we can always consult with headquarters and receive great support. So we have both the speed and the knowledge, which are very beneficial for us," he adds.

"GF Casting Solutions is well positioned to capture the opportunities in this market, thanks to our comprehensive capabilities across R&D, manufacturing and product validations," says Daniel Hu. "Our unique advantage is that we are able to provide customers with not only reliable products but also wholesome solutions to new problems and challenges."

"GF accumulated enough experience to meet our requirements"

How does GF Casting Solutions support you in meeting the requirements for producing innovative, competitive cars in China for the world market?

Firstly, GF is a global player with extensive experience working with carmakers around the world. It has accumulated enough experience to meet our requirements and it has done quite a few prospective researches, which has proved to be very helpful to us. Secondly, we chose GF because of its high efficiency in sales support and honesty when proposing solutions.

Why do you appreciate the collaboration with GF Casting Solutions?

Although there are many technological challenges, our collaboration with GF has gone rather smoothly. Compared with traditional carmakers, electric car manufacturers have a much shorter development cycle. I'm glad that GF and Aiways were able to work together to complete tasks in a very timely manner.

What do you expect regarding future collaboration with GF Casting Solutions?

Aiways will continue to invest in R&D and technological innovation. I hope that GF could further support us in developing new materials and manufacturing techniques, while further lowering the cost and shortening development time. I also hope that GF's China team will continue to enhance its capabilities in prospective research, giving greater support to Aiways' innovation in future.



Interview with Wang Dongchen

An industry veteran, Wang Dongchen used to run the R&D department of FAW, one of China's largest carmakers. In his 27-year long career, Wang Dongchen was responsible for the development of many popular car models in China. He joined Aiways in December 2016 as Chief Technology Officer.



Growing further in the medtech sector

GF Machining Solutions is developing tailor-made solutions for its customers in the booming medical technology market. The implant manufacturer Zimmer Biomet particularly relies on the precision of GF machines.

Medical implants improve the quality of life for many people. Given the high demand and rapid technological progress, for example in artificial joints, the medtech sector is flourishing: global revenue increased from USD 339 billion to USD 468 billion between 2014 and 2019. According to forecasts, it will grow to as much as USD 522 billion by 2022.¹

It's all about precision

GF Machining Solutions is well positioned with various technologies—from Laser to Milling—in automated manufacturing machines for implant production technology. The division works with its customers across the entire machine life cycle, from the initial design to the maintenance. Thomas Brauen, Head of Sales at GF Machining Solutions International in Biel (Switzerland), looks after seven customers in the Swiss medtech sector. Zimmer Biomet is one of them. The US company operates in 24 countries worldwide and has more than 1'000 employees in Switzerland. About two million shoulder, hip, knee, trauma, and back implants leave the factory in Winterthur each year.

Five new Milling machines from GF Machining Solutions have been in use at Zimmer Biomet since 2019—three MILL S 600 U machines to produce knee and hip implants, plus one MILL S 400 and one MILL E 700 U for mold construction. Zimmer Biomet has already had two further machines in its 2'000 square meter production hall since 2006. "Our expectations for the new GF machines are very high, and automation plays a key role for us," says Pascal Meier, Manufacturing Engineer at Zimmer Biomet with joint responsibility for procurement of the five GF machines. "The GF machines perfectly meet our needs."

Pascal Meier worked closely with GF Machining Solutions from the order to delivery and testing of the new machines—both with Thomas Brauen, Head of Sales, and Andreas Signer, Project Manager and Key Account Manager. "Depending on the intensity of the project, we were in contact on an almost daily basis. This was necessary to discuss the customer's special requirements," remembers Andreas Signer. "For Zimmer Biomet, for example, we put the Milling machines' chip ejection on the opposite side of the machine due to space requirements," he explains. "Whenever possible, we are happy to meet our customers' special wishes, whether these are specific clamping solutions or requirements for the chip or tool management system."

¹ Source: Statista

“Our requirements are high. The machines from GF offer us exactly the right quality.”

Pascal Meier, Manufacturing Engineer at Zimmer Biomet



<https://youtu.be/tXNKAzHc8G4>

GF wants to increase medical market revenue

GF Machining Solutions has been developing solutions for the medtech sector for decades, starting with Milling machines and subsequently adding Laser texturing, Laser drilling and Additive Manufacturing machines. They are embedded in an automated concept. These solutions enable clients to produce flawless hip and knee joints, dental implants, plates for bone fractures, and instruments for surgeons. GF Machining Solutions is taking advantage of these great market opportunities in the medtech sector to expand its range and technological profile. This means a wider customer portfolio and solutions that are more advanced. GF Machining Solutions has its sights set on the global medical market, where it plans to significantly increase its sales volume in the coming years. The division is broadly based for this, offering a short time to market, highly precise machines with repeat accuracy, and decades of experience.

The medtech sector is developing fast, and requirements are becoming more and more demanding, which means that producers must always be up to date. Pascal Meier believes that "the degree of automation and digitalization in the production process will rise, also at Zimmer Biomet." The medtech specialist has already shown interest in solutions for surface processing with laser systems and other machining centers. GF Machining Solutions will solve with passion these future needs.



Pascal Meier (center) from Zimmer Biomet worked closely with Thomas Brauen (left) and Andreas Signer (right) from the order to testing of the five new GF machines.

Services of GF Machining Solutions in the medtech field

- + Additive Manufacturing for orthopedic implants and surgical instruments
- + Milling for injection molds of medical consumables, die casting molds for implantable devices, orthopedic implants or surgical instruments
- + EDM for minimally invasive surgical instruments and complex micro molding applications
- + Laser texturing: engraving molds for medical consumables and packaging—and for connective tissue growth in the future
- + Automation cells for reliable production quality and better cost control
- + Precision Tooling for the entire production process across several technologies

“GF Machining Solutions reacts fast”

What does Zimmer Biomet produce in Switzerland?

At Zimmer Biomet in Winterthur, we mainly produce shoulder, hip, knee, trauma, and spinal implants. We use the GF Machining Solutions equipment to make hip and knee implants. The quality requirements are high.

How does GF Machining Solutions support you?

We require a very precise procedure and high repeat accuracy. The machines from GF Machining Solutions offer us exactly the quality that we need.

What do you particularly like about working with GF Machining Solutions?

I particularly appreciate the fast response time to our inquiries and the support in solving problems. It's a very good working relationship.



Interview with Andreas Kläui

Andreas Kläui is
Manufacturing Associate
Director at Zimmer Biomet
and responsible for
mechanical processing at the
Winterthur site.