The core competencies that span Lonza’s segments are advanced manufacturing and quality-control systems, superior regulatory expertise, in-depth market knowledge, sales, marketing and business development, as well as extensive technical customer-support and R&D capabilities. In 2018 Lonza conducted its operations through the following segments: Pharma & Biotech and Specialty Ingredients.
Segments
Lonza Pharma & Biotech’s vision is to enable our customers to meet some of the greatest challenges in patient treatment and by Delivering the Medicines of Tomorrow, Today®. The Pharma & Biotech market-focused segment comprised the following offerings in 2018:

- Clinical development services and manufacturing in biologics and small-molecule businesses
- Commercial manufacturing in biologics and small-molecule businesses
- Consumables and research tools

The modalities across biologics include mammalian and microbial expression systems, and cell and gene technologies, covering both drug substance and parenteral drug product services. The modalities across small molecules cover early and current good manufacturing practice (cGMP) chemical intermediates, and customized active pharmaceutical ingredients (API), including highly potent APIs (HPAPIs) and cytotoxics. Drug formulation and enhanced oral dosage forms and delivery systems complete the capability. The consumables include cell-culture, transfection and molecular biology tools for life-science research.

Overview of Lonza Pharma & Biotech Technologies and Integrated Value Chain Offerings

- **Small Molecules**
  - Early and cGMP Chemical Intermediates, Customized API Including HPAPI, Cytotoxics

- **Bioconjugates**

- **Biologics**
  - Mammalian and Microbial Expression Systems, Cell and Gene Technology

- **Oral Dosage Forms and Delivery Systems**

- **Parenteral Drug Product Services**

Across 3 continents
- 29 sites
- 8,684 FTE

**Drug Substance**

**Discovery**
- basic research
- disease discovery

**Development**
- drug discovery
- drug development

**Manufacture**
- clinical supply
- commercial supply

**Distribution**
- fill & finish
- marketing, sales, distribution

> 575 clinical development programs
> 290 commercial medicines supplied (including dosage form and delivery systems)
> 200 billion capsules produced (including capsules for pharma and consumer health and nutrition businesses)
### Pharma & Biotech

<table>
<thead>
<tr>
<th></th>
<th>2018</th>
<th>Change in %</th>
<th>2017 'restated'</th>
<th>Change in %</th>
<th>2017 'pro-forma'</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>3,113</td>
<td>29.3</td>
<td>2,408</td>
<td>13.9</td>
<td>2,733</td>
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<tr>
<td>CORE EBITDA</td>
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<td>38.7</td>
<td>736</td>
<td>23.6</td>
<td>826</td>
</tr>
<tr>
<td>CORE EBITDA margin in %</td>
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<td>30.6</td>
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<td>30.2</td>
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<tr>
<td>CORE EBIT</td>
<td>826</td>
<td>41.9</td>
<td>582</td>
<td>27.3</td>
<td>649</td>
</tr>
<tr>
<td>CORE EBIT margin in %</td>
<td>26.5</td>
<td></td>
<td>24.2</td>
<td></td>
<td>23.7</td>
</tr>
</tbody>
</table>

Lonza Pharma & Biotech continued to outperform with 14% organic sales growth and a 32.8% CORE EBITDA margin, an improvement of 260 bps on a like-for-like basis. This segment delivered CHF 3.1 billion sales for 2018; and CORE EBITDA amounted to CHF 1.0 billion, a pro-forma increase of 23.6% versus prior year. Excellent organic CORE EBIT growth of 27.3% resulted in a CORE EBIT of CHF 826 million and a CORE EBIT margin of 26.5%.

### CORE EBITDA million CHF and CORE EBITDA Margin in %

<table>
<thead>
<tr>
<th>Year</th>
<th>EBITDA</th>
<th>Change in %</th>
<th>Margin %</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>385</td>
<td>26.6%</td>
<td></td>
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<tr>
<td>2015</td>
<td>418</td>
<td>26.2%</td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td>526</td>
<td>29.5%</td>
<td></td>
</tr>
<tr>
<td>2017</td>
<td>826</td>
<td>30.2%</td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td>1,021</td>
<td>32.8%</td>
<td></td>
</tr>
</tbody>
</table>

1. Restated to reflect adoption of IFRS 15
2. Reported Lonza full-year 2017 financial results (restated for IFRS 15) include Capsugel full-year 2017 financial results
3. Reported pro-forma full-year 2017 financial results (restated for IFRS 15) include Capsugel full-year 2017 financial results
**Biologics Businesses**

We serve our customers throughout the product lifecycle – for all clinical manufacturing needs and through the transition of their products to commercial manufacturing.

**Integrated Offerings in Pharma & Biotech – Biologics**

**Commercial Manufacturing**

Lonza is a leading commercial contract manufacturing provider for biopharmaceuticals. Our offerings include the manufacture of commercial drug substance of monoclonal antibodies (mAbs) and recombinant proteins from mammalian cell culture and microbial fermentation. Currently our manufacturing product portfolio includes products that represent essential active pharmaceutical ingredients (APIs) for life-saving medicines, including cancer treatments and orphan drugs for rare diseases where no alternative treatment exists.

Today Lonza’s commercial mammalian manufacturing offerings have a global footprint, comprising production scales from 2,000 L to 20,000 L across three existing state-of-the-art current good manufacturing practice (cGMP) sites: Portsmouth, NH (USA), Porriño (ES) and Tuas, Singapore (SG). Furthermore, we are adding new capacity in our Ibex™ Solutions biopark in Visp (CH), with the aim of bringing flexibility and the most-fitting scale of capacity to fulfill different market segments’ and customers’ needs.

Our commercial microbial manufacturing business currently operates from three plants at one location in Visp (CH), with a customer base that is a healthy mix of large, mid-size and emerging pharmaceutical companies.
Recent pipeline development in novel molecules such as antibody fragments, protein scaffolds and bioconjugates require a toolbox of solutions and our experience handling complex molecules. Our know-how and platform technologies enable our customers to define their own tailored solution from a full range of services. Our GS Xceed® Gene Expression System for mammalian expression and our XS® Technologies for microbial expression include well-established processes for efficient, scalable and regulatory-compliant commercial manufacture. In addition, our Ibex™ Solutions further help to mitigate customers’ capital expenditure investment risks; and we have the capabilities to construct dedicated facilities for specific manufacturing needs.

Our commercial track record and proven expertise over two decades have enabled us to gain a broad accreditation from global health authorities, including the U.S. Food and Drug Administration (FDA) and the European Medicines Agency (EMA), among others. We pride ourselves on being the market leader for highly customized, reliable and innovative solutions to meet customers’ needs.

**Discover More** For further information about our mammalian cell-culture capabilities for large-molecule drug substance, as well as for descriptions of Lonza’s mammalian cell culture facilities, including Portsmouth, Porriño and Singapore, please visit our mammalian manufacturing webpage. For further information about our microbial fermentation capabilities, please visit our microbial development and manufacturing webpage. Explore Lonza’s worldwide sites by location via our 360° Virtual Tours.

**Clinical Development and Manufacturing**

Lonza’s Clinical Development and Manufacturing business focuses on the early phase of drug development, from late discovery through clinical trial supply. In 2018 we offered a broad portfolio of drug substance and drug product development services and clinical supply manufacturing across the mammalian and microbial modalities.

Our bioconjugate team in Visp (CH) is one of the industry leaders in process development and current good manufacturing practice (cGMP) manufacturing of clinical and commercial bioconjugates, including antibody drug conjugates (ADCs). The team’s track record encompasses manufacture of several bioconjugate constructs, including customers’ novel payload, linker and conjugation technologies.

Our teams work with customers to ensure reliable delivery of integrated, innovative and value-adding gene-to-patient custom solutions. We work in partnership with our customers to enable them to progress their candidates rapidly and effectively through clinical development in order to deliver medical treatments successfully to patients.
**Late Discovery Services**

For our customers in late discovery phase, our Applied Protein Services offering includes technologies and programs designed to assess and mitigate risks, reduce attrition and improve the quality and safety of therapeutic proteins in a cost-efficient and timely manner. These technologies include our Epibase® *in silico* and *in vitro*, cellular immunogenicity screening, and our antibody humanization and deimmunization services.

Our Sentinel APART™ Platform serves as a tool for antibody aggregation prediction and re-engineering, and our manufacturability assessment service is used to help predict and mitigate manufacturing risk. Early-stage customers also benefit from our mammalian and microbial-based Lightpath™ material supply services for their research and proof-of-concept studies. We also complement these services with developability assessment services to support our customers’ lead candidate selection. More information on our late discovery services is available online.

**Protein Expression**

When a lead candidate is selected, our industry-leading expression technologies, including the GS Xceed® Gene Expression System and XS® Microbial Expression Technologies, are used to create commercially relevant cell lines or strains for protein expression.

**Process Development or Transfer**

Following creation of a new cell line or strain, we engage in a program of process development and scale-up studies that creates a robust process suitable for transfer to current good manufacturing practice (cGMP) sites. Once a process has been established, we can manufacture products to support not only preclinical activities, but also clinical trial material. In addition to developing a process at Lonza, we are also able to transfer into Lonza many product and process technologies that have been developed by our customers.

**Parental Drug Delivery**

Lonza’s Drug Product Services (DPS) team in Basel (CH) focuses on parenteral dosage forms and offers solutions for customers developing therapeutic proteins, peptides, cell and gene therapies as well as small molecules that require a parenteral dosage form. These products are for injection and infusion for intravenous, subcutaneous and intraocular routes of administration.
The DPS team provides a complete portfolio of services for parenteral dosage forms, including formulation development, simulated clinical administration setup and testing, analytical method development and quality control, primary packaging and device design and integration, drug product process development, and manufacturing of parenteral dosage forms for stability testing, preclinical or clinical testing.

Special services also include surfactant characterization and characterization of excipient degradation, extractables and leachables assessment, and container-closure integrity and device testing. Our experts have multiple years of experience in the development, manufacturing, testing and commercialization of parenteral dosage forms and related regulatory requirements; and they have extensively researched and published in this area. Our customers benefit from seamless integration of pharmaceutical and drug substance development for rapid and reliable entry into the clinic and for robust late-stage development. In addition, Lonza DPS offers best-in-class analytical and specialized services for routine processes and troubleshooting in pharmaceutical manufacturing.

The recent expansion of Drug Product Services in Basel (CH) contributes to Lonza’s gene-to-patient offerings.

**Discover More** Our Clinical Development and Manufacturing global footprint of manufacturing facilities includes Slough (UK) and Cambridge (UK), Hayward, CA (USA), Basel (CH) and Tuas, Singapore (SG), for mammalian projects, and Visp (CH) for mammalian, microbial and bioconjugates projects. Explore Lonza’s worldwide sites by location via our 360° Virtual Tours. For further information about Epibase®, Sentinel APART™, GS Xceed® Gene Expression System, as well as our development and manufacturing capabilities for large-molecule drug substance and drug products, click here.
Highlights and Initiatives 2018

Lonza’s biological businesses performed strongly in the reporting year. The Commercial Mammalian and Microbial Manufacturing team continued to benefit from a solid customer base and strong demand, enabling the business to secure additional contracts for the mid- and long-term.

The year 2018 saw substantial investment in the Portsmouth, NH (USA) site, including mid-scale biologics. We introduced new mid-scale assets for commercial mammalian manufacturing to meet strong demand and complement existing small- and large-scale assets within the Lonza network. Lonza is installing multiple 6,000 L bioreactors at the site to meet existing and new customers’ needs, with construction starting in late 2018. The reactors were designed from the outset with advanced in-line testing and automation capabilities.

Lonza Biologics’ Global Footprint and Investments

A Portsmouth, NH (USA)
- Mammalian (Commercial manufacturing)
- Cell and gene technology

B Hayward, CA (USA)
- Mammalian (Clinical development and manufacturing)

C Houston, TX (USA)
- Cell and gene technology

D Slough (UK)
- Mammalian and microbial (Clinical development and manufacturing)

E Geleen (NL)
- Cell and gene technology

F Basel (CH)
- Lonza Pharma & Biotech headquarters
- Drug product services

G Visp (CH)
- Microbial (Clinical development and manufacturing; commercial manufacturing)
- Mammalian in ibex™ Solutions (Clinical development and manufacturing; commercial manufacturing) Operational from 2020

H Porrino (ES)
- Mammalian (Commercial manufacturing)

I Guangzhou (CN)
- Mammalian (Clinical development and manufacturing) Operational from 2020

J Tuas (SG)
- Mammalian (Clinical development and manufacturing; commercial manufacturing)
- Cell and gene technology
The new facilities have been designed to ensure reliable delivery of innovative medicines. With a strong focus on automation, Lonza is implementing full-suite process analytic technology (PAT) and advanced multi-variate analysis (MVA) to help ensure consistent performance. This hybrid facility also incorporates state-of-the-art, single-use technologies for simplified processing.

« These new facilities in Portsmouth have been designed specifically to deliver innovative medicines for our customers and their patients. They will be enabled by cutting-edge technology developed with our R&D team and the decades of expertise at our Portsmouth site. »

Marc Funk, COO of Lonza Pharma & Biotech

The operations of our Tuas, Singapore (SG) single-use bioreactor facility developed as planned in 2018. The first Singapore 2,000 L batch was successfully released in November. The batch was supplied under the strategic manufacturing agreement with one of our customers for their therapeutic antibody. Lonza performed cell-line development and provided clinical supply for this antibody at our Slough (UK) site and used our established GS Gene Expression System®. The process was subsequently transferred into 2,000 L scale disposable bioreactors at Lonza Singapore, which will continue to manufacture material for our customer’s ongoing clinical trials and, if the antibody is approved for commercial use, will also provide the commercial supply.

Demand for Lonza’s development services and clinical manufacturing in all technologies remained strong, further fueled by increasing pressure to shorten time to the clinic and to the market, which creates new fast-track approval pathways for regulatory authorities. Therefore, we are expanding our clinical development services and manufacturing capacity in Slough (UK).

Earlier than expected, our Clinical Development and Manufacturing team saw full changeover to Lonza platforms, processes and technologies at our Hayward, CA (USA), facility, which was acquired in September 2017 from Shire. The first customer batches were released already in the third quarter of 2018, and the transfer of new and existing customers to the Hayward site continues to progress well.
Shaping the Future of Biomanufacturing with Ibex™ Solutions

In September 2018, Lonza expanded our Ibex™ Solutions facility in Visp (CH), with two new, innovative packages – Ibex™ Design and Ibex™ Develop. The two new offerings are designed to meet the evolving needs of biotech companies with antibody therapies, from the preclinical stage through to commercialization. This expansion includes drug substance development and drug substance and now also drug product manufacturing. Together with the existing Ibex™ Dedicate offering that targets companies in later stages, the new investment allows Lonza’s customers to benefit from a complete product lifecycle management at one site. Advanced technology, single-use bioreactors and improved platform processes are applied to shorten time to clinic and to market, while innovative business models are expected to increase predictability. The innovative offerings received positive feedback in the market. Construction at the Visp (CH) site is well underway, and the Lonza-Sanofi joint venture (the first Ibex™ Dedicate) and the Ibex™ Design and Ibex™ Develop (one wing of one building) will become operational from 2020. The full Ibex™ Solutions facility is a generational project.

More information on our Ibex™ Solutions is available online.

« We are capitalizing on attractive organic growth opportunities, like the recently announced expansion of our Ibex™ Solutions offerings in Visp (CH) that provide clinical development and manufacturing services along the whole value chain and now include fill and finish. »

Richard Ridinger, CEO of Lonza
**Ibex™ Design** covers the early stages of creating a new biologic, from gene through to clinical phase I. The offering comprises a pioneering fixed-price gene-to-vial package with terms under which Lonza can deliver drug products based on at least 1 kg drug substance within 12 months – shortening timelines from receipt of gene sequence to Investigational New Drug (IND). This package also includes the reservation of a manufacturing slot for clinical resupply. Ibex™ Design allows aspiring companies to start clinical trials earlier while reducing uncertainty. The result strengthens our capabilities from the early stages of drug development all the way through to commercialization. It will help biotech companies deliver life-saving medicines to patients faster.

**Ibex™ Develop** helps companies seamlessly and rapidly transition from clinical phase II to commercialization. Co-location at one site eliminates the need for tech transfers, and accelerates the path to market. This offering enables biologics license applications (BLAs) to be submitted within 22 months from the start of process characterization. Eliminating the need for tech transfers, allowing process optimizations and creating operational efficiencies are all expected to accelerate the path to market.

With **Ibex™ Dedicate**, a fully customized commercial supply solution that is exclusive for our customers’ products, Lonza is able to offer complete product lifecycle management in one site. A pre-built wing and faster ramp-up could save our customers up to 30 months total time to market. Ibex™ Dedicate allows our customers to delay their capacity build decisions and better manage investment risk. Moreover, flexible ownership and operating models give our customers freedom of choice, in combination with a technology-agnostic solution that can be tailored to suit mammalian and microbial production, vaccines and cell and gene therapies.
Cell and Gene Technology

Cell and gene therapies are seen as the new frontier in medicine. The field of cell and gene therapy has the potential to transform the way patients diagnosed with cancers or genetic diseases can be treated. These novel drug candidates provide drastically improved patient outcomes and, in some cases, may even prove to be curative. With our comprehensive offering that spans allogeneic and autologous cell therapies, as well as viral vector gene therapies, Lonza is at the forefront of supporting this new frontier.

However, the manufacture of such medicines poses new challenges that are unique to each of the sectors we serve in cell and gene therapy. For example, the small, patient-scale batch sizes for autologous products require scale-out approaches to meet commercial demand for certain larger indications. Furthermore, getting these drugs to patients around the globe may present logistical challenges. For allogeneic cell therapies and viral-vector gene therapies, other challenges exist, such as scale-up to increase batch sizes and treat more patients per batch. Today the cost of production still represents a major hurdle on the way to the market. New technologies are needed that enable robust and efficient manufacturing and yield replicable high-quality medicines.

Enabling Technologies Offered by Lonza Cell and Gene Technology

By developing innovative technologies and platforms that industrialize the manufacturing of cell and gene therapies, our goal is to enable developers to make these therapies mainstream and commercially viable. With decades of experience in cell processing and as an industry leader in process development and manufacturing of cells and viral vectors under current good manufacturing practices (cGMP), Lonza is well positioned to achieve this goal. Our broad service offerings – combined with a global footprint that spans the United States, Europe and Asia – enable us to support our clients throughout clinical development and commercial production.
At our new Houston, TX (USA) facility, the Lonza team offers development and cGMP services for cell and gene therapies, including viral vector production. The range includes a wide selection of cell and virus types, such as T-cells, dendritic cells, pluripotent stem cells (PSCs), mesenchymal stem cells (MSCs) and adenoviral, adeno-associated virus (AAV) and lentiviral vectors.

« We really want anyone we work with to be genuinely engaged in the purpose. I do not consider Lonza a vendor; I consider Lonza a partner. I do not consider this a manufacturing facility; I consider this a house of hope. »

Nick Leschly, CEO of bluebird bio at Lonza Houston Grand Opening, 10 April 2018

We aim to be the industry partner of choice in this process and to help our customers drive pioneering therapies to the market by investing in enabling technologies and using our expertise to support the development and commercialization of new, innovative therapies. Our scientists and engineers bring decades-long development experience across a broad spectrum of cell types and technologies. This expertise builds the backbone of an extensive service offering and provides a tailored approach to analytical development, manufacturing and regulatory services.

Cell and gene technology is one of the key pillars for Lonza Pharma & Biotech's overall strategy: Delivering the Medicines of Tomorrow, Today®.

Discover More Additional information about our services, such as process development, cGMP manufacturing, assay development, analytical and all other related services, is available on our cell and gene technology website. Some of our facilities can also be viewed on our 360° Virtual Tour.
Highlights and Initiatives 2018

During the reporting year, a key focus at Lonza was on the development of our cell- and gene-therapy capabilities, an area of high potential for the future of medical treatment.

The opening of the world’s largest dedicated cell-and-gene-technology manufacturing facility in Pearland, Greater Houston, TX (USA) in April 2018 was a major step forward for Lonza. The expanded capabilities were well received, and the transfer of existing and new customers into the facility progressed as expected during 2018. At 300,000 square feet (27,870 square meters), the site is growing and recruiting highly qualified personnel to meet market demand.

Lonza announced in February that it was to establish centers of excellence for cell and gene technology to support and accelerate the growth of this priority area for the company. The Lonza sites in Pearland and in Geleen / Maastricht (NL) will offer a fully integrated range of cell-and-gene-therapy services, including process and analytical development, clinical product supply and commercial product supply. Lonza’s facilities in Portsmouth, NH (USA) and Singapore (SG) will continue to serve as clinical and commercial manufacturing sites. The centers represent a global network spanning the United States, Europe and Asia and provide flexible solutions to support fast-track programs.

Lonza is actively investing in key innovation technologies in viral vector manufacturing, allogeneic manufacturing in 3D bioreactors and autologous manufacturing in the Cocoon™ system. In 2018 we further strengthened our commitment to drive the next generation of manufacturing patient-specific and personalized therapies with the acquisition of a controlling stake in Octane Biotech, with the right to acquire full ownership of the Cocoon™ technology. The increase in equity share will allow us to further develop the technology necessary to support the growing need for scalable autologous manufacturing.
Small-Molecule Businesses

Drug candidates based on chemical technologies in the development pipeline are increasingly innovative and often highly potent specialty medicines. They enable drastically improved treatment opportunities for patients in need. Fast-track regulatory approval programs have been introduced to meet these needs by shortening the time to market and compressing timelines for the developer. At the same time, the increased potency can lead to challenges in development and manufacturing, including the need for specialized handling in high containment systems. As these molecules are often poorly soluble, expertise in formulation is also required to increase bio-availability. Lonza is uniquely positioned to provide solutions to these challenges.

Integrated Offerings in Pharma & Biotech – Chemical Technologies

Lonza has one of the widest breadths of expertise in the production of highly potent active pharmaceutical ingredients (HPAPIs) within the contract manufacturing organization industry. This expertise spans highly skilled teams, state-of-the-art facilities and approximately 20 years of experience in successfully commercializing HPAPI products and full scalability allowing our customers to use clinical-phase appropriate manufacturing scales. For the production of other APIs, Lonza’s breadth and economy of scale, our many years of experience in launch and long-term manufacture, and the dedication of our personnel ensure that we remain a leader in small-molecule contract manufacturing.

Drug Substance Development and Manufacturing

Lonza has one of the widest breadths of expertise in the production of highly potent active pharmaceutical ingredients (HPAPIs) within the contract manufacturing organization industry. This expertise spans highly skilled teams, state-of-the-art facilities and approximately 20 years of experience in successfully commercializing HPAPI products and full scalability allowing our customers to use clinical-phase appropriate manufacturing scales. For the production of other APIs, Lonza’s breadth and economy of scale, our many years of experience in launch and long-term manufacture, and the dedication of our personnel ensure that we remain a leader in small-molecule contract manufacturing.

The small-molecule team is heavily involved in the development of therapies designated by the U.S. Food and Drug Administration (FDA) as breakthrough therapies. Accelerated time-to-market is a key factor in their development and production. Lonza has driven processes to ensure APIs are delivered to the accelerated timelines to support these launches.

>270 clinical small-molecule programs

>265 commercial small-molecule programs

(including dosage form and delivery systems)
With the 2017 transformational acquisition of Capsugel and the bolt-on acquisition of Micro-Macinazione, Monteggio (CH) the small-molecule businesses further extended our offerings for development and manufacturing of highly potent active pharmaceutical ingredients (HPAPiS). Lonza now has a fully established value chain for highly potent products from the active pharmaceutical ingredients (API) through particle engineering into the final dosage forms. This broad offering adds substantial value to our customers as it simplifies interfaces, reduces costs and accelerates timelines.

**Drug Product Development and Manufacturing**

The newly acquired drug formulation development capabilities from Capsugel aim to overcome our customers’ key challenges of complexity, bioavailability, solubility and high potency, while helping shorten lead times for drug launches. As the majority of the products in clinical development pipelines have poor solubility, we are addressing that market need with our broad toolkit for bio-availability enhancement, our expertise in APIs and modulating pharmacokinetics, and our capability in handling highly potent materials and dosage-form expertise to support modulated release.

The addition of Micro-Macinazione to the Lonza portfolio has extended our small-molecule offerings into particle engineering that facilitates the conversion of APIs to the finished dosage forms. By adding Capsugel, a world leader in enhanced oral dosage delivery technologies with a market-leading position in hard capsules, Lonza has created a powerful all-round player, from drug substance and formulation expertise to final dosage form.
Pharma Hard Capsules

The hard-capsule business continues to build on a long track record of ingenuity, credibility and flexibility to deliver an exemplary experience and drive added value creation for our customers. Proprietary and patent-protected technologies, unrivaled expertise in capsule polymer science, and product and process design capabilities all help customers meet their target product profiles and commercial objectives while allowing rapid design and development across a wide range of dosage forms.

Leveraging extensive experience in capsule delivery solutions, Lonza also offers an unmatched value-added service portfolio with a global quality organization, which includes an integrated supply chain, technical and operational engineers, color lab support and global regulatory expertise. Continuing a commitment to delivering high-quality products and maintaining the highest standard of regulatory compliance, the hard-capsule business has established standards and systems to oversee internal and external quality performance, which is known industry wide.

Capitalizing on the vast global network built by Lonza and Capsugel, coupled with the unmatched science and engineering behind the hard-capsule business, Lonza can provide a broad range of capsule polymers, sizes and designs for the industry. We also have the ability to offer integrated product design, development, clinical supply and commercial manufacturing services to our customers around the world. The diversified customer base includes companies that make branded, generic and specialty pharmaceuticals, as well as biotech products and over-the-counter medicines.

Discover More  For further information about our offerings in small molecules, including our expertise in HPAPI and other active pharmaceutical ingredients, visit our website. Click here for a 360° Virtual Tour of our facilities in Visp (CH) and Nansha (CN). Visit our Capsugel and Micro-Macinazione websites.
Highlights and Initiatives 2018

Throughout the year our small-molecule businesses – including capsule and combined ingredient and dosage-form offerings – continued to perform strongly. Lonza Pharma & Biotech’s small-molecule businesses reported continued operational and commercial improvements. Demand for Lonza’s offerings in API development and clinical and commercial manufacturing held firm. Pharma hard capsules and dosage form and delivery systems performed above expectations as a result of buoyant customer interest and the capture of cross-selling synergies.

Drug Substance Development and Manufacturing

Lonza expanded HPAPI manufacturing at our Visp (CH) plant when Lonza and Clovis Oncology celebrated the opening of a new, dedicated production train for Rubraca® (rucaparib), Clovis’s U.S.- and EU-approved drug for several ovarian cancer indications. The innovative operating model and technology deployed reduce production lead time and costs. Under a long-term agreement, the new, state-of-the-art monoplant enables security of supply and flexibility to ensure a rapid response to changes in market demand for Rubraca®.

Lonza added two new manufacturing suites at the Visp site for the manufacture of antibody drug conjugate (ADC) payloads, based on a tailored business agreement with a major biopharmaceutical partner. The new suites enable handling of a variety of highly potent products with occupational exposure levels down to 1ng/m³ and thereby strengthen the overall bioconjugation capabilities of Lonza in Visp.

Lonza announced the launch of our pharmaceutical early-intermediates supply initiative. The initiative leverages chemical production facilities at the Visp site to address increasing global early-intermediates supply security and quality concerns. Lonza now offers customers an integrated supply chain from non-GMP early intermediates to current good manufacturing practice (cGMP) advanced intermediates and APIs.

Drug Product Development and Manufacturing

During 2018 Lonza completed the integration of the Capsugel businesses, and the addition of Capsugel further strengthened the depth and breadth of Lonza’s offerings for small molecules. It expanded the reach of Lonza’s contract development and manufacturing organization (CDMO) and products businesses and further growth is expected in the years ahead, not least through the synergies the acquisition has unleashed.
Our partnership with Lonza and the opening of this dedicated facility in Visp (CH) should allow the continued availability of Rubraca® to patients who may benefit from its use, now and in the future

Patrick Mahaffy, CEO and President of Clovis Oncology

Our oral drug product services added to the positive year 2018 by securing several projects with new and existing customers and by strengthening the overall portfolio. Firm demand continued for dosage forms and for delivery solutions and services to enhance bioavailability and efficacy of drugs.

First synergistic projects have been captured that either leverage Lonza's network to extend the value chain or that cross-sell to customers. Innovation projects are ongoing and deal with continuous manufacturing and automation, bioavailability and efficacy enhancements through the introduction of new formulations, modulated-release mechanisms and new approaches to the manufacturing of high-potency substances.

In February we announced the expansion of our late-stage clinical and commercial encapsulation capabilities for solid oral and inhaled dosage forms in North America, with the installation of a new encapsulation unit at our integrated product development and manufacturing facility in Tampa, FL (USA). The added capacity will further strengthen our speed-to-market capabilities. This specialized drum-dosing technology is used for powder-in-capsule (PIC) filling for oral solid dosage forms including dry powder inhaler (DPI) applications.
Pharma Hard Capsules

The hard-capulse business reported a robust year 2018 and saw increasing demand for Lonza’s specialty polymer capsules by pharmaceutical companies to enhance bioavailability and to provide a wider choice for customers. Geographic expansion programs, expansions across the sites and operational excellence programs have been implemented and are ongoing to strengthen the business’s global presence to meet customer demand.

From early-stage development to commercial solutions, the hard-capulse business continues to offer the broadest portfolio of gelatin and Hydroxypropylmethylcellulose (HPMC) capsules. In August Capsugel® Colorista™ capsules – a high-quality capsule based on an «all-colorants» formulation – was launched. It is a new single research & development solution for pharmaceutical formulation development that cuts development time and allows for flexibility with testing. This new capsule further expands the Lonza Capsugel® clinical offering.
Consumables and Research Tools

Lonza’s Bioscience Solutions offerings include cell-culture, transfection and endotoxin testing tools for the life-science industry. We serve customers across the world in academic and government institutions, as well as in major biotech and pharmaceutical organizations.

Our Bioscience Solutions team provides products and customer services in life-science research with our Biowhittaker™ Cell Culture Media, Clonetics™ and Poietics™ primary cells and media, Nucleofector™ Transfection technology and CellBio Services custom solutions.

For the drug-discovery and translational research markets, we offer products and services targeting cardiovascular, respiratory, neurological, metabolic, cancer and other disease-research areas.

Bioscience Solutions’ therapeutic cell-culture media business serves customers in the pharmaceutical and biotech industry. Therapeutic cell-culture media are used in the production of therapeutics, including antibodies, antibody drug conjugates (ADCs), vaccines, cell- and gene-therapy applications and other biologics.

Lonza Testing Solutions offers endotoxin-detection assays that are applied in pharmaceutical product-release testing, medical-device testing and dialysis clinics to help ensure the safety of injectable drugs, implantable medical devices and dialysis equipment.

Our fully integrated MODA™ software solutions streamline quality-control processes and offer insight into manufacturing operations, with quick access to management, compliance and trending data.

Discover More Additional information about our offerings, such as process development, cGMP manufacturing, assay development, analytical and all other related services, is available online. For further information specifically about Bioscience Solutions products – such as Endotoxin-Detection Assays, PowerCHO Advance™ Media, Hepatocytes, RAFT™ 3D Cell Culture System, CytoSMART™ 2 System, CellBio Services, 4DNucleofector™ LV (large volume) Transfection Device, MODA™ Paperless QC Micro Solution and PyroGene™ rFC Assay – visit our Bioscience Solutions website. Visit our Walkersville, MD (USA), Durham, NC (USA), Cologne (DE), Verviers (BE) and other facilities online and take a 360° Virtual Tour of some of our facilities.

>2,800 scientific publications used a Lonza Bioscience product

274 bioscience products filed with regulatory agencies

110 different primary cell types
Highlights and Initiatives 2018

Market demand for Lonza's Bioscience Solutions technologies and products was sustained in the reporting year, notably for our cell-culture modeling, transfection, genome editing and endotoxin product portfolio. Demand for Lonza's research media and testing products continued in 2018. New research products were launched to further respond to customer demand. Improvements in production availability continued to be implemented to increase supply to meet demands of existing and new customers.

Among our many advances in 2018, Lonza developed cell-culture models that more closely mimic the in vivo environment for enhanced research into drug-induced liver injury and hepatic-signaling pathways and for improved in vitro hepatotoxicity testing. Lonza presented our latest research into developing more physiologically relevant in vitro cell-culture models for Absorption, Distribution, Metabolism, Excretion and Toxicity (ADME-Tox) testing. The Quasi Vivo® System is an interconnected fluidics system to create more physiologically relevant cell-culture conditions, which helps researchers improve the predictive value of their studies.

« Building on Lonza’s industry-respected cell-culture portfolio, the addition of the Quasi Vivo® System is an important step forward in advancing the use of primary cells in biomedical research. »

Dr Maureen Bunger, Product Manager for absorption, distribution, metabolism, excretion (ADME) / Tox Solutions at Lonza

Another advance, the RAFT™ 3D Culture System, creates hepatocytes with stronger cytochrome responses and increased stability. This system helps researchers to simulate in vivo conditions, while 3D culturing of organotypic in vitro liver models using HepaRG™ cells improves the predictability of studies looking into drug metabolism, drug-induced liver injury and hepatic-signaling pathways.

These advances highlight Lonza's scientific initiatives to support the development of cell-based modeling systems with more human relevance for toxicity research by helping improve the translatability of in vitro drug metabolism, phenotypic screening and mechanistic toxicity studies.
The Clustered Regularly Interspaced Short Palindromic Repeats (CRISPR / Cas9) system has emerged as the genome-editing method of choice for research, medicine and biotechnology applications. Compared with other gene-editing technologies, such as Zinc Finger Nucleases (ZFNs) and Transcriptional Activator-like Effector Nucleases (TALENs,) CRISPR / Cas9 is simpler to re-engineer, easier to use, more versatile and capable of targeting multiple sites.

This market trend supported the continued growth of our Nucleofector™ Transfection Technology, ranging from research applications to preclinical studies. A wide range of publications confirmed the use of our technology as the gold standard for genome-editing applications. We also pre-marketed our next-generation endotoxin automation solution PyroTec™ Pro Robotic Solution, which integrates instruments, endotoxin reagents and software into a robotic platform, providing a fully automated workflow solution.

In 2018 Lonza unveiled an advanced electronic batch record execution platform, MODA™ Execution System. The software platform builds on our extensive informatics know-how and experience as a contract manufacturing organization. It offers a flexible, cost-effective solution for consolidating and managing batch and quality data produced across cell- and gene-therapy manufacturing processes.

To strengthen our sales channels and accelerate our digital presence, we introduced a new website and e-shop in 2018. The new site offers state-of-the-art technology, including mobile-friendly design and navigation, detailed product pages with substantial technical information and a full suite of Lonza's technical resources with personalized content after log-in. In addition, it includes a modern e-commerce platform that allows us to expand our sales channels by offering improved e-shop capabilities and streamlined order-taking via punch-out solutions.
Specialty Ingredients

In 2018, the Specialty Ingredients segment operated in:

- a Consumer Health division
- a Consumer & Resources Protection division
- a Water Care business unit

The Consumer Health division addressed the fast-moving consumer goods markets in nutritional ingredients for supplements and functional food, hygiene and personal care. The Consumer & Resources Protection division addressed a wide range of industrial markets, as well as the global agricultural markets. The Water Care business unit offered a broad range of products and solutions for residential and industrial water treatment globally. On 1 November 2018, Lonza announced that it had entered into a definitive agreement with Platinum Equity to sell Lonza’s Water Care business. Therefore, Water Care is being reported as discontinued operations for all periods presented.

Overview Lonza Specialty Ingredients Offerings

>19,000 customers worldwide
42 manufacturing sites
Serving 60 consumer, healthcare and industrial markets globally

Consumer Health Consumer & Resources Protection

Consumer-Centric Products

Health & Well-Being Solutions
Nutritional Supplements, Functional Food & Personal Care
Animal Feed

Microbial-Control and Hygiene Solutions
Professional and Consumer Hygiene, Home & Personal Care
Paints & Coatings, Industrial Material and Crop Protection

Segment Platform

Enabling Technologies and Services
Biopolymers
Composite Resins, Services in Fine Chemistry and White Biotechnology Industrial Intermediates
Specialty Ingredients delivered 3.4% organic sales growth and a 22.1% CORE EBITDA margin despite a challenging environment for cyclical categories and some raw material pricing and supply-chain related headwinds in parts of the portfolio. The segment reported CHF 2.4 billion sales for 2018, and CORE EBITDA amounted to CHF 528 million (pro-forma −5.4% versus prior year). CORE EBIT was CHF 421 million (pro-forma −6% versus prior year) and resulted in a CORE EBIT margin of 17.6%.

### Specialty Ingredients

<table>
<thead>
<tr>
<th></th>
<th>2018</th>
<th>Change in %</th>
<th>2017 'restated</th>
<th>Change in %</th>
<th>2017 'pro-forma</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>2,391</td>
<td>13.7</td>
<td>2,102</td>
<td>3.4</td>
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</tr>
<tr>
<td>CORE EBITDA</td>
<td>528</td>
<td>6.7</td>
<td>495</td>
<td>(5.4)</td>
<td>558</td>
</tr>
<tr>
<td>CORE EBITDA margin in %</td>
<td>22.1</td>
<td></td>
<td>23.5</td>
<td></td>
<td>24.1</td>
</tr>
<tr>
<td>CORE EBIT</td>
<td>421</td>
<td>5.8</td>
<td>398</td>
<td>(6.0)</td>
<td>448</td>
</tr>
<tr>
<td>CORE EBIT margin in %</td>
<td>17.6</td>
<td></td>
<td>18.9</td>
<td></td>
<td>19.4</td>
</tr>
</tbody>
</table>

1. Restated to reflect classification of Water Care business as discontinued operations
2. Reported Lonza full-year 2017 financial results include Capsugel full-year 2017 financial results

### CORE EBITDA million CHF and CORE EBITDA Margin in %

<table>
<thead>
<tr>
<th>Year</th>
<th>CORE EBITDA</th>
<th>Change in %</th>
<th>Margin in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>360</td>
<td>16.7%</td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td>390</td>
<td>18.0%</td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td>426</td>
<td>18.7%</td>
<td></td>
</tr>
<tr>
<td>2017</td>
<td>558³</td>
<td>24.1%</td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td>528</td>
<td>22.1%</td>
<td></td>
</tr>
</tbody>
</table>

3. Reported pro-forma full-year 2017 financial results include Capsugel full-year 2017 financial results
Consumer Health

The Consumer Health division within Lonza’s Specialty Ingredients segment is uniquely positioned to address consumer needs in human and pet nutrition, personal care, and home and professional hygiene through our portfolio of powerful science-backed ingredients, formulation expertise and dosage form delivery capabilities.

The teams in Consumer Health are capitalizing on the evolving consumer trends toward healthier lifestyles that include food, beverage and dietary supplements, protection from dangerous viruses and other pathogens in hospitals, homes, at work and in all other surroundings, and the ability to look and feel their best.

Overview Consumer Health Offerings

- Health & Well-Being Solutions
  in Nutritional Supplements, Functional Food & Personal Care
- Microbial-Control and Hygiene Solutions for Professional and Consumer Home & Personal Care

- High-value ingredients backed by science
- Innovative delivery forms and integrated solutions
- Functional ingredients and bioactives enhancing consumer experience
- Formulation expertise
- Next-generation consumer protection
- New preservation solutions
- High-performance disinfection and hygiene solution
- Industry-leading regulatory and toxicology expertise

Our consumer market-oriented, collaborative innovation approach and our world-class quality allow us to develop solutions for our customers that offer superior product efficacy combined with delivery forms that enhance the consumer experience. In addition, we have unique capabilities and expertise that we leverage from the pharma industry to the consumer world. This advantage means that our customers have the regulatory support to obtain registrations required by local governmental agencies. Our products are supported by science in order to make marketable claims that help deliver meaningful differentiation. We enable our customers to improve the lives of consumers by creating healthier environments, providing better nutritional support, improving vitamin and supplement delivery and bioavailability, and offering customer-focused hair-, scalp- and skin-care solutions through the Consumer Health businesses.
Leveraging Overlaps of Pharma & Biotech and Consumer Health

Health and Well-Being Solutions

Nutritional Supplements and Functional Food Offerings

Lonza’s health and nutrition businesses offer customers fully integrated solutions from concept through product commercialization. We supply branded health ingredients that address the key market segments in the nutritional supplement category, along with regulatory and commercial support. Differentiated benefits and a wide range of applications make our products attractive for the dietary supplement, food and beverage, and human and pet nutrition markets.

With the integration of the Capsugel portfolio in 2017, Lonza’s health and nutrition business has become a leading global solutions provider in nutraceuticals with our combined offering of science-backed ingredients, innovative delivery forms and integrated solutions for our customers. Lonza offers formulation know-how, delivery solutions, strong service capabilities and global regulatory expertise to help our customers take their innovative and differentiated nutritional products to market in the shortest possible time.

We apply our consumer market insights and our extensive experience in pharmaceutical-delivery science to help our customers improve the bio-availability, targeted delivery, swallowability, odor masking and taste of their nutritionals. Our technology enables us to develop unique combination products and visually appealing dosage forms that meet the expectations of today’s health-conscious consumers.
Personal Care Offerings

Our personal care business serves the global beauty and well-being markets as an established supplier of functional ingredients, such as specialty plant-based emulsifiers and aesthetic modifiers, and traditional and next-generation preservation and protection systems. Through custom-developed fermentation and technologies perfected for pharma, the personal care team is introducing premium-positioned bioactive functionals, which enhance the consumer experience and uniquely improve the performance of finished products. As a world-class manufacturer, we are among the global leaders in innovative hair- and skin-care formulations and ingredients.

Microbial Control and Hygiene Solutions

As a global leader in registered biocides, preservatives and antimicrobial formulations, the hygiene and preservative business offers home and institutional solutions for disinfecting or sanitizing trouble areas in schools, food-processing plants, restaurants, grocery stores, hospitals, operating theaters, health clinics and more. Our products offer broad-spectrum efficacy and extensive substrate compatibility. We provide industry-leading regulatory and toxicology expertise, supporting compliance with global regulatory regimes. Our robust data packages and innovative, market-focused research & technology offerings enable our customers to stay at the forefront of industry developments.

Discover More  For further information about our businesses, visit our Consumer Health website or one of the following websites: Hygiene / Preservation / Nutrition / Personal Care / Capsules & Food Supplements
Highlights and Initiatives 2018

Specialty Ingredients’ Consumer Health division grew organic sales by 6.3% to CHF 1.1 billion in 2018. CORE EBITDA amounted to CHF 292 million, a 13.2% like-for-like increase with a 27.3% CORE EBITDA margin, which is an improvement of 170 bps on a like-for-like basis.

<table>
<thead>
<tr>
<th>Consumer Health</th>
<th>2018</th>
<th>Change in %</th>
<th>2017</th>
<th>Change in %</th>
<th>2017 pro-forma</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>1,071</td>
<td>34.2</td>
<td>798</td>
<td>6.3</td>
<td>1,008</td>
</tr>
<tr>
<td>CORE EBITDA</td>
<td>292</td>
<td>49.7</td>
<td>195</td>
<td>13.2</td>
<td>258</td>
</tr>
<tr>
<td>CORE EBITDA margin in %</td>
<td>27.3</td>
<td>24.4</td>
<td>25.6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This division’s performance was driven by Lonza's proprietary nutritional ingredients, innovative dosage forms and increasing demand for specialty polymers hard capsules, e.g. all-natural and clean-label products, as well as Lonza’s household and professional hygiene solutions. New, combined Lonza-Capsugel offerings experienced strong demand, and 2018 saw a series of product launches that brought together innovative nutritional ingredients, optimized formulations and tailored capsule-delivery technologies.

Additional growth momentum resulted from geographic expansion across all businesses and from further expanded offerings for health and well-being as well as microbial-control and hygiene solutions.

Health and Well-Being Solutions

Nutritional Supplements and Functional Food Offerings

The consumer health and nutrition businesses continued to build a robust launch pipeline of synergistic offerings, and consumer insight-driven concepts have been successfully introduced into markets. Throughout 2018 full integration of Capsugel brought healthy momentum, fueled by the strengthened global reach of the combined businesses, further geographic expansion, innovative product offerings and synergies. Our more than 30 new dietary supplement product concept launches that join Lonza’s specialty ingredients and former Capsugel’s innovative dosage forms continue to attract interest. Building on our geographical expansion, we launched our first liquid dosage form solution in South Korea and a first combination UC-II®/liquid dosage-form solution product in Russia, a key growth region in EMEA.
On the ingredients side, the two leading actives – the UC-II® ingredient for joint health and Carnipure® ingredient in sports – were benefiting from high demand. In 2018 published research further validated Lonza's UCII® brand as a leader in the joint health ingredient space. Discover more about UC-II® in our video.

The expansion of production capacity in Lonza's Greenwood, SC (USA) site – to combine capsule production, ingredient production and finished dosage form development – is progressing as planned. Lonza broke ground for the expanded capabilities in September as part of an ongoing program to enhance production of our nutritional ingredients and dosage-form technologies. The facilities, due to open in mid-2019, will add approximately 50,000 ft² (4650 m²) of new manufacturing space. The Greenwood site currently produces empty capsules and finished dosage forms for the global biopharma and consumer health and nutrition markets.

« The Greenwood, SC (USA) investment further demonstrates our commitment to providing high-quality products and services to our customers worldwide. Bringing together expanded manufacturing capabilities for our science-backed ingredients, with the production of our innovative dosage forms in one facility, allows us to offer a broader range of integrated, end-to-end solutions for our customers – from function through to form. »

Sven Abend, COO of Lonza Specialty Ingredients
Strong customer interest was noted in our innovative product offerings, including our specialty plant-based polymer Vcaps® Plus capsule offering efficacy, as well as other clean-label, vegetarian and vegan solutions, which are non-GMO and free of preservatives, allergens, gluten, sugar and starch.

Lonza has also invested significantly in a range of certified vegetarian and vegan delivery systems, including our new Vcaps® Plus Spirulina capsules. The first of our next generation of innovative, vegetarian, food-colored capsules, Vcaps® Plus Spirulina capsules are designed to support manufacturers in creating true clean-label solutions for the sports nutrition market. An example of a new finished product concept that uses the Vcaps® Plus Spirulina capsule is the ZMA® mineral formulation.

Harnessing the vibrant natural colors from food, Vcaps® Plus Purple Carrot was added to our plant-based capsule portfolio. Offering a true clean label, it combines the clean-label advantages of Vcaps® Plus, a plant-based hypromellose capsule, with the natural food coloring of purple carrots. We further expanded our offering with new Natural Colorant and TiO2-free Hard Capsules concepts and received a positive initial customer response.

Examples of Lonza Nutritional Supplements Offerings Introduced in 2018
Personal Care Offerings

With the launch of two Bioactive Functional ingredients, ScreenLight™ Block and XPressEV™, the Personal Care business demonstrated our commitment to investing in innovative solutions that meet our customers’ current and future needs. ScreenLight™ Block provides a proven, powerful defensive shield against the visible skin-aging effects of blue light and environmental stressors, such as UV light and pollution. XPressEV™ bioactive functional helps mitigate the visible effects of chronological aging, leading to the appearance of firmer and «fitter» skin, as demonstrated in independent efficacy studies.

The personal care portfolio was further strengthened with ongoing innovation initiatives, such as the latest research on our specialty polyglyceryl ester surfactants (PGEs). They are naturally derived emulsifiers that can be easily customized to suit the needs of the global personal care market for greener personalized cleansing formulations. The PGEs are proprietary and versatile alternatives to synthetic surfactants, and they offer excellent foam generation while maintaining mildness.

Microbial Control and Hygiene Solutions

The businesses in professional and consumer hygiene performed well, boosted by the tighter regulatory landscape and demand across all regions for modern hygiene solutions and effective prevention against pathogenic micro-organisms.

Leveraging our global expertise in microbial control, Lonza is developing the next generation of preservative solutions in consumer products, anticipating the latest and upcoming regulatory challenges and changing consumer preferences.

As a trusted supplier to homecare formulators, Lonza offers a portfolio of biocides, many intended to be supported through the Authorization Process of the European Biocidal Products Regulation (BPR).

With the launch of NUGEN® – a new generation of low-streak, quat-containing disinfectant wipes, we set the standard for convenience and ease of use in professional markets.

NUGEN® NR Wipes developed for the North American markets are an ideal choice for control of norovirus and 13 other pathogens in food service facilities, schools, long-term care facilities and day-care centers. These cost-effective, quat-containing disinfectant wipes leave no harsh chemical residues; hence, surfaces do not require a potable-water post-rinse.
Consumer & Resources Protection

Leading with customer-focused, innovative smart solutions for a consumer-centric healthy environment, the Consumer & Resources Protection division addresses a wide range of industrial markets, as well as the global agricultural markets. We strive to develop environmentally sustainable and innovative technologies in response to our customers’ demands and the increasing challenges presented by the global regulatory landscape. Please see our Sustainability Report for further information.

Overview Offerings in Consumer & Resources Protection

Coatings and Composites Offerings
- In-can preservatives systems
- Dry film protection
- Engineered wood protection
- Anti-fouling surface modification
- Product development and application support

Agricultural Offerings
- Molluscicides and other formulated crop protection and hygiene treatments
- Adjuvants and formulation ingredients and preservatives

Coatings and Composites Offerings
Lonza’s coatings and composites businesses serve global markets with a wide array of specialty solutions for the protection, enhanced performance and modification of the end-use characteristics of various materials, including carbon fibers, fabrics, leather, metals, plastics, stone and wood.

Our specialty biocide and non-biocide products are used to produce coatings that are applied superficially or by penetrating processes. They protect the materials from biological (e.g. insects, decay, algae, mold and mildew) degradation and physical-chemical (e.g. fire, moisture) degradation and are applied in paints, inks, sealants, adhesives, backing materials for bath mats and carpeting, shower curtains, wallboards, flooring and ceiling materials, wood preservatives and many other applications.

15 markets served
>200 biocide formulations
30 composite resins systems
We also deliver specialty solutions for in-process or end-of-process application in the manufacture of various composite materials (e.g. wood-plastic composites, laminated veneer, wood-based products, etc.) Our composite thermoset resin systems are used in modern consumer electronics to help enhance performance, as well as in the production of lightweight, reliable structural and interior elements for passenger aircraft.

**Agricultural Offerings**

Our agricultural businesses provide highly effective products and contract manufacturing services designed to improve crop yields and food quality. These dedicated offerings include agro specialty solutions, custom manufacturing and animal nutrition. We supply products and services to industrial customers, as well as finished products for end use by agricultural enterprises and farmers.

Lonza’s offerings to the agricultural markets are derived from our unrelenting focus on customers’ needs and requirements and are based on our expertise in chemical and biological technology. The agro solutions business includes industrial intermediates, preservatives and additives for agrochemical formulations in addition to a broad range of final crop-protection products.

Our state-of-the-art custom manufacturing supports customers in the production of modern herbicides, insecticides and fungicides, including biologically derived products, such as biopesticides, biostimulants and other microbial active ingredients and intermediates. Lonza’s services also include full life-cycle management for customers’ products.

The animal nutrition business offers animal feed additives and supports the production-animal sector by providing branded, high-quality ingredients with clear benefits that are reinforced by our distributors and agents around the world. Examples include our vitamin B3 compounds (niacin and niacinamide) and our Carniking® and LaraFeed® products. For the beneficial impact of Carniking® on the performance and recovery in active dogs, Lonza has been granted a U.S. patent.

**Discover More** For further information about our Consumer & Resources Protection businesses, visit one of the following websites: Coatings and Composites / Agro Ingredients

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>1,000 customers globally

>250 product offerings

The world leader in Metaldehyde based Molluscicides
Highlights and Initiatives 2018

The specialty portfolios within Consumer & Resources Protection, especially in composites and material protection, reported ongoing positive demand and performed strongly as expected. We continued to leverage our leading position and expertise in microbial-control solutions to attain greater market penetration in various industrial applications.

<table>
<thead>
<tr>
<th>Consumer &amp; Resources Protection</th>
<th>2018</th>
<th>Change in %</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>1,320</td>
<td>1.2</td>
<td>1,304</td>
</tr>
<tr>
<td>CORE EBITDA</td>
<td>236</td>
<td>(21.3)</td>
<td>300</td>
</tr>
<tr>
<td>CORE EBITDA margin in %</td>
<td>17.9</td>
<td></td>
<td>23.0</td>
</tr>
</tbody>
</table>

Newly launched solutions to address regulatory changes and related market uncertainty resonated well with all major customers and generated strong customer interest. Feeding into the increasing global market demand for methylisothiazolinone (MIT)-free biocide formulations, the coatings and composites businesses announced the launch of a new addition to the Proxel® range of preservatives into the North American market, the Proxel Spektra™ Preservative. This dual-action, broad-spectrum preservative offers effective protection of industrial products against spoilage caused by bacteria, yeast, and mold. This formulation benefits from the use of two complementary active ingredients, providing enhanced anti-microbial efficacy and long-term protection while being more beneficial for our environment.

Helping our customers meeting the Biocidal Products Regulation (BPR) in Europe, in 2018 we also introduced Tanalith® E9000, a BPR approved industrial and residential preservative for solid wood applications. Tanalith® E9000 contains the highest level of BARamine® that makes the preservative more robust against aggressive wood-destroying fungi. Growth initiatives in the innovative and highly specialized solutions portfolios of engineered wood and mold control further helped balance soft demand for and the effects of discontinuations within the basic materials and intermediates portfolio.

In our agricultural business, we are a leader in the molluscicide market and offer a number of solutions to help farmers protect their crops. Our active ingredient META® metaldehyde and our formulated products, generally marketed under the Axcela® brand, are now all sold globally. Slugs and snails can pose significant problems for both the professional grower of agricultural crops and gardeners. Molluscicidal baits containing Lonza’s Meta® active ingredient are an effective way of controlling slug and snail pests. In 2018 we successfully expanded our product offering through geographical and portfolio expansion in
New Zealand, South Korea, Taiwan, Turkey, Germany and France. With Celenco® AG+ we launched a compatibility adjuvant for crop protection, thus strengthening our position in Malaysia. Similarly, the launch of Pylon®, a pyrethrum-based insecticide for fruits and vegetables, bolstered our position in New Zealand.

Whereas our specialty offerings and customer-specific solutions in Consumer & Resources Protection continued to see high demand, several negative developments created headwinds for the division. A challenging environment for cyclical businesses in mature parts of the portfolio, like basic materials and intermediates, as well as raw material price increases and supply-chain constraints, had a negative impact in 2018.

Results were also influenced by the ongoing downward cycle for basic feed ingredients, especially for vitamin B3. It translated into significant lower prices and volumes for this part of the agricultural business. Our marine antifouling business remained soft, as expected, in line with lower demand in global shipbuilding and maintenance. Some positive momentum was obtained from tightened regulatory frameworks in emerging markets.

Operational and commercial excellence initiatives are ongoing. We also launched an initiative to supply a certain set of raw materials out of our multi-purpose plants in Visp (CH) that meets the highest levels of environmental standards. Customers have now started to switch to Lonza for certain raw materials as we offer proven reliability.

Despite these headwinds the division delivered CHF 1.3 billion sales for 2018 (1.2% organic growth versus prior year). CORE EBITDA was CHF 236 million (-21.3% versus prior year) with a CORE EBITDA margin of 17.9%.

The restructuring of the basic materials portfolio was ongoing in 2018, with discontinuation of non-core activities, such as the fertilizer business, while the emphasis on innovative offerings increased.
Discontinued Operations: Water Care Business Unit

On 1 November 2018, Lonza announced that we had entered into a definitive agreement with Platinum Equity to sell Lonza’s Water Care business. Therefore, Water Care is being reported in 2018 as discontinued operations. For more information, refer to Results from Discontinued Operations.

While the Water Care business unit contributed to our portfolio of delivering solutions for the Healthcare Continuum® through clean water for residential and commercial use, the business model does not fully fit with the overall Lonza portfolio. The residential Water Care business follows a business-to-consumer approach whereas all other Lonza businesses follow a business-to-business approach. We believe that we have found the optimal partner for the business to develop as an independent company through investing in innovation and growth and with that give new perspectives to the global sites and its employees.

As a highly specialized service provider the Water Care business is one of the world’s leading suppliers of sanitizers and other treatment chemicals for pools, spas and water parks. It is also rapidly growing sales in the treatment of surface waters, as well as water for drinking, agriculture, irrigation, food processing and industrial applications. For these types of applications, it offers oxidizing and non-oxidizing biocides, proprietary halogen stabilizers and innovative solutions that include proprietary feeder systems and controllers.

Water Care has strong leadership positions around the world. The business has a long heritage of providing clean-water solutions, with more than a century of experience in developing innovative water-treatment offerings.
The areas of application for Water Care products include residential and commercial swimming pool and spa water, as well as drinking water, process water, wastewater, irrigation, surface water and industrial water. The business builds customer relationships by offering technical customer support, research & technology, formulation expertise, regulatory excellence and powerful brand marketing, as well as product reliability and quality. The Water Care business is divided into two sections based on customer needs: Residential Water encompasses ProDealer and Mass channels and Industrial, Commercial, Municipal and Surface Water (ICMS) offers chemicals and services.

Overview Water Care Offerings

Water Care

Microbial-Control Solutions

Residential Water Offerings
- Innovative products for clean, clear pool and spa water
- Smart technologies for water testing and pool care
- Unit dose water soluble pods deliver toss-and-go convenience

ICMS Water Offerings
- Global water care solutions capitalizing on the growing need for clean water
- Solutions aligned with high-impact water threats
- Trusted brands and expertise

The Residential Water brands keep recreational water clean and free of algae and bacteria, while maintaining chlorine stabilizer and pH levels within the recommended ranges.

The ICMS business includes a broad portfolio of chemicals, formulations and innovative solutions to answer customer needs for water sanitization and treatment. As highly specialized service provider, Water Care offers a wide range of branded products to the market and provides onsite support for end-use customers. The ICMS business supplies products and automated feeder systems for commercial pools, including theme parks, hotels, public pools and camp parks. In addition to municipal drinking water and wastewater treatment facilities, it offers industrial water solutions for processes used in the pulp and paper, food and beverage, power, chemical and steel industries.
Highlights and Initiatives 2018

Throughout the year the Water Care business continued to implement commercial excellence initiatives and innovative new offerings but faced headwinds due to a late seasonal start in North America and Europe and higher transportation costs. However, new customer contracts were secured for the recreational and industrial water businesses; and the outlook for 2019 is positive while restructuring and business model redesign are ongoing. In addition, new business development efforts within the e-commerce space are fully on track and are expected to show accelerating growth momentum.

Significant investments in innovative new offerings and related brand restaging, supported by sales initiatives and expected new business in recreational water, are strengthening the mid-term outlook. We introduced the following new products and innovations, among others, within our residential businesses:

**HTH® Text Strips** help consumers by bringing smart technology to manual testing of pool and spa water. Consumers text an image of their test strip to a dedicated number and receive a text with recommended dosing and step-by-step care instructions.

**HTH® and Spa Selections®** are bringing digital packaging to the pool and spa-water care space. Consumers scan the digitally enhanced packaging with their smartphone for at-shelf access to a broad range of information.

**Pulsar® Infinity and CCH® Endurance Feeder Systems**, a slow-dissolving calcium hypochlorite feeder system, gained wide acceptance and adoption by major dealers and pool operators alike within the commercial pool segment.

**Pond-Klear™** is a fast-acting aquatic herbicide that produces visible results in a significantly reduced time.

In 2018 the Industrial, Commercial, Municipal and Surface Water (ICMS) business also continued to invest in innovative technologies and offerings under the BlueSense™ business platform, e.g. in technologies to convert chlorides naturally present in water into effective disinfection agents.

Another example is the Frexus® Granular offering. According to label instructions for applications such as hard-surface disinfection, washing of fruit and vegetables and carcass washing, the risk of potentially harmful organisms can be drastically reduced.
Lonza Forward Looking Statements
Forward-looking statements contained herein are qualified in their entirety as there are certain factors that could cause results to differ materially from those anticipated. Any statements contained herein that are not statements of historical fact (including statements containing the words «outlook,» «guidance,» «believes,» «plans,» «anticipates,» «expects,» «estimates» and similar expressions) should be considered to be forward-looking statements. Investors are cautioned that all forward-looking statements involve risks and uncertainty. There are a number of important factors that could cause actual results or events to differ materially from those indicated by such forward-looking statements, including the timing and strength of new product offerings; pricing strategies of competitors; the company’s ability to continue to receive adequate products from its vendors on acceptable terms, or at all, and to continue to obtain sufficient financing to meet its liquidity needs; difficulty to maintain relationships with employees, customers and other business partners; and changes in the political, social and regulatory framework in which the company operates, or in economic or technological trends or conditions, including currency fluctuations, inflation and consumer confidence, on a global, regional or national basis. In particular, the assumptions underlying the Outlook 2019 and Mid-Term Guidance 2022 herein may not prove to be correct. The statements in the section on Outlook 2019 and Mid-Term Guidance 2022 constitute forward-looking statements and are not guarantees of future financial performance. Lonza’s actual results of operations could deviate materially from those set forth in the section on Outlook 2019 and Mid-Term Guidance 2022 as a result of the factors described above or other factors. Investors should not place undue reliance on the statements in the section on Outlook 2019 and Mid-Term Guidance 2022. Except as otherwise required by law, Lonza disclaims any intention or obligation to update any forward-looking statements as a result of developments occurring after this report was published.

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For publications and further information please contact:

Lonza Group Ltd
Muenchensteinerstrasse 38
4002 Basel, Switzerland
Tel +41 61 316 81 11
www.lonza.com

Investor Relations
Tel +41 61 316 85 40
investor.relations@lonza.com

Media / Corporate Communications
Tel +41 61 316 88 40
media@lonza.com

Share Register
c/o Computershare Schweiz AG
P.O. Box
4601 Olten, Switzerland
Tel +41 62 205 77 00
Fax +41 62 205 77 90
share.register@computershare.ch

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