Company Profile
A history of growth committed to inspection
ALL FOR SAFER MEDICINES

With billions of injectable doses administered annually worldwide, the need for reliable, efficient and technologically advanced automatic inspection machines has seen a constant increase.

Inspection and control systems for all medicines are the key to ensuring effectiveness and safety in all automated production processes and global distribution.

Liquid and freeze-dried pharmaceutical products are required to be inspected as far as possible for the presence of visible foreign particulate matters and other defects, such as container integrity.

Since the 1950’s Brevetti Cea has been manufacturing ground-breaking inspection machines for the pharmaceutical industry and it has been working with passion and commitment to supporting companies around the world in order to guarantee the use of safer medicines for patient health.
A HISTORY OF GROWTH COMMITTED TO INSPECTION

Since the late 1950s, Brevetti CEA has been manufacturing inspection machines for injectable pharmaceutical products. The company first concentrated on the production of semi-automatic machines until when, thanks to the intuition of the Owner, the production shifted its focus on fully automated inspection systems, which now represent the core business of Brevetti CEA.

Brevetti CEA offers a comprehensive range of automatic inspection and leak detection machines for injectable pharmaceutical products contained in syringes, ampoules, vials, cartridges and bottles. Each machine is unique as it is tailored and designed to meet the most complex technical requirements and to give optimum performance.

Thanks to the combination of innovative technology and proprietary software, recently empowered also by the acquisition of a Danish company deeply specialized in image-based deep learning algorithms with an extensive experience in the pharmaceutical industry, Brevetti CEA offers high levels of accuracy and performance that are unique in the world.

Deep know-how, continuous investments in research and development, passion for innovation and machines’ reliability surely represent Brevetti CEA strengths.

At Brevetti CEA we strive to deliver high quality products and complying with the laws and regulations which govern our business activities have been our long-standing principles.

Across the world, Brevetti CEA references include a large variety of countries, customers and major international pharmaceutical groups. With more than 2,500 machines installed worldwide, Brevetti CEA is internationally recognized as The Inspection Specialist.
THE REASONS OF OUR COMMITMENT

For 65 years, Brevetti CEA has been working with passion and commitment to supporting companies around the world to guarantee the use of safer medicines for patient health.

We believe in our role to help pharmaceutical companies to grant safer products in the market. This base concept is the foundation of our motto "All for safer medicines".

Our mission is to anticipate the requests coming from international markets and transform them into new features and capabilities for our inspection machines.

"After 65 years, we continue to look positively to the future and we want to offer our contribution with the belief that there cannot be genuine development if there is no respect and care for our people, our business community and our natural resources.

The world is in strong need of responsible companies, we are aware there is a lot to do and we want to be part of the change!"

Giovanni Ferrari, President

Brevetti CEA’s commitment to corporate social responsibility (CSR) is based on some key values supporting our strong beliefs:

- Professional commitment and respect for quality
- Integrity
- Respect for all human being and human rights
- Respect for our employees
- Data protection and privacy
- Care and respect for the environment
BREVETTI-INTELLIGENT-VISION

The heart of Brevetti CEA is fully expressed in the new working framework “BREVETTI-INTELLIGENT-VISION”: an optimized integrated vision platform of consolidated and new technologies that enhances performance to a complete new level.

#OpticalAlignment

Advanced mechanical design guarantees precise optical alignment between cameras, lights and containers for superior detection performance. Fast container rotation is performed by controlled servo motors and can be independently adjusted according to each specific product.

#HighFrameRate

High-resolution cameras acquire up to 100 images on each particle inspection unit. The high number of frames is the key to ensuring accurate detection and low risk of false rejects.

#MultipleInspection

Particles detection based on image differentiation, thresholding and blob classification through physical features is now used in combination with Brevetti CEA Particle Trajectory Tracking based on background subtraction, blob extraction and motion prediction to reach higher efficiency and reduce false rejection. Supervised learning techniques are applied for bubble filtering.

#ArtificialVision

Assisted machine learning tools for deeper understanding of the defects nature are applied in several Brevetti CEA inspections. Accurate parametrization has been highly simplified by introducing machine learning tools in the inspection software.

#SmartHMI/#CheckAll

A single intelligent proprietary HMI permits the complete overview of the machine. Flexible and intuitive, it simplifies the equipment use and reduces operation time. The new Brevetti HMI release grants real-time live view of the inspection process, a user-friendly guided parameterization tool as well as the innovative capability of storing images of rejected containers to allow process and quality investigation.
SUPERCHARGE VISUAL INSPECTION WITH AI

As of today, Deep Learning can be easily considered the hottest topic in the field of Artificial Intelligence.

Since 2018 Brevetti CEA embeds machine learning algorithms into the inspection machines software for particles detection, bubbles discrimination and cosmetic analysis.

Recently, in order to continue to improve the standards of inspection quality, Brevetti CEA acquired CRITERION AI, a Danish Company deeply specialized in image-based deep learning algorithms with an extensive experience in the pharmaceutical industry.

The merger between the already existing Deep Learning Division of Brevetti CEA and the Team of experts of Criterion AI gave birth to BREVETTI AI, a Brevetti CEA company, fully dedicated to artificial intelligence applications and solutions.

Brevetti AI makes use of the latest advancements in deep learning to better classify, segment and detect anomalies in images; it leverages the power of deep learning to decrease false rejection and increase detection rates for pharmaceutical and medical devices.

Brevetti AI has designed a ready-to-use powerful platform to support deep learning workloads such as a data management, model training and validation. The platform complies with CFR 21 Part 11 and GMP Annex 11.

A new inspection era has started!!
INSPECTION SOLUTIONS

Whether they are water-like, suspensions, vaccines, oil-based or freeze-dried - contained in syringes, vials, ampoules or cartridges - injectable products are required to be inspected as far as possible for the presence of visible foreign particulate matters and other defects, such as container integrity.

The inspection of particles and all cosmetic defects is at the heart of all Brevetti CEA solutions. Injectable products and containers are 100% inspected by tailor-made vision systems designed to meet the most exacting pharmaceutical standards.

Our efficient and technologically advanced automatic inspection machines can reach the speed of 800 pieces per minute on liquid products and 600 pieces per minute on freeze-dried products and syringes.

Given the complexity and sensitivity of most of the pharmaceutical products, all Brevetti CEA systems grant smooth mechanical handling throughout the process. The integration of sophisticated no-contact handling solutions permits a fully automatic cycle, including de-nesting and re-nesting activities on both glass and plastic syringes.
CONTAINER CLOSURE INTEGRITY

Container integrity has always been an extremely important topic in the Pharmaceutical Industry as it represents one of the key factors for product’s safety.

Brevetti CEA offers integrated and stand-alone leak testing solutions for liquid and freeze-dried pharmaceutical products based on different non-invasive, non-destructive testing methods:

High Voltage Leak Detection in Liquid

Pinhole, cracks and pierced needle shield inspection can be detected by the well-known and widely proven HV principle based on the measurement of electrical conductivity of sealed containers using a high voltage electric field.

LD module is the synthesis of more than thirty years of Brevetti CEA expertise in the inspection and leak detection world.

Available as stand-alone machine, it can also be used in combination with our inspection machines, becoming the most compact and performing “Inspection Lines” for liquid filled ampoules, vials and cartridges available on the market.
Head Space Gas Analyzer in Freeze-dried

Based on TDLAS spectroscopic technology, the laser is modulated in frequency to assure a more accurate, stable and reliable measurement. Light absorption is proportional to oxygen concentration in the optical path.

The system can discern oxygen-free (good) containers from the ones contaminated by oxygen due to leakage or process fault.

The installation of HGA leak detection unit into an automatic inspection machine integrates the classic detection capabilities of visual inspection and it represents the state-of-the-art in terms of leak detection in products filled under low oxygen concentration or modified atmospheres (nitrogen).
DIFFICULT TO INSPECT PRODUCTS

As a result of the continuous investments in research and development, Brevetti CEA has designed an innovative automatic solution for the inspection of the so-called “difficult to inspect” products, such as Cell Therapy products, IV Solutions Bags, Hyaluronic Acid, Albumin, Propofol, Iron sucrose etc.

This revolutionary concept merges the human into the automatic visual inspection, combining the advantages of motion and optics flexibility with the stability of inspection results. This allows the creation of a “humanlike” equipment with the possibility to vary the framing and to take advantage of the lighting sources that affect the image.

Thanks to a wide set of software tools, including a brand-new off-line setup mode to allow the parameters optimization phase completely off-line, the robot is a powerful system very easy to setup and validate.
AFTER-SALES SERVICES

At Brevetti CEA we strive to deliver timely, attentive, reliable and professional after-sales and spare parts service during the entire lifecycle of the equipment.

In this perspective, a complete package of after-sales services is available to maximize Customer investment and to help to meet the operational goals.

Our Support and Maintenance services are strategically conceived to add value to our Customer’s machines and systems over the years (based on cost-efficiency and long-term performance), and to maintain a relationship of trust and collaboration with our Customers, preventing any causes of failure and promptly resolving any problems that arises.

Our Service Level Agreements are modular and flexible in order to meet Your specific needs, and are generally composed by three macro packages:

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<th>1 - Helpdesk and Troubleshooting Team</th>
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<td>Track all activities and serve at our best</td>
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<th>2 - Remote Service Connections</th>
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<td>Solutions to our customers toughest challenges</td>
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<th>3 - Preventive Maintenance</th>
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<td>Run smooth manufacturing throughout the year</td>
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<th>4 - Production Security Parts</th>
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<td>Improve efficiency, productivity and reduce TCO</td>
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<th>5 - Integrated Predictive Maintenance, IPM</th>
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<td>Act early, avoid hassle.</td>
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<th>6 - Embedded Engineer</th>
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<td>Support where and when it’s needed.</td>
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<th>7 - Knowledge Transfer Programs</th>
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<td>Skills development to secure manufacturing continuity</td>
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<th>8 - Remote Parametrization</th>
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<td>Our expertise your eye, remote new product AVI</td>
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Our Service Level Agreements

A brief description of each service is detailed here below, and, depending on Your need, Brevetti CEA is always available to study a customized service package to complying with Your specific operational and processes needs.

1) Helpdesk & Troubleshooting Team

Our Helpdesk & Troubleshooting Team is committed to delivering quality and prompt service to support Customers with their operational questions, requests of interventions and to manage any possible unexpected event on the machine.

2) Remote Service Connections

Remote Service is the fastest tool to assist Customer with technical issues and breakdown. Through Remote Assistance Brevetti CEA Technical Service Engineers can interact directly with the machine HMI to get a complete overview of the machine current status. Direct access to machines allows our Technical Service Engineers to: monitor the equipment, promptly diagnose operational issues, provide immediate troubleshooting, transfer control and information data simultaneously, change parameters, evaluate images and software check, reduce downtime and risk of damages and reduce operating costs.

3) Preventive Maintenance

In order to ensure the proper machine maintenance, Brevetti CEA offers a modular Preventive Maintenance package specifically tailored to Customer’s needs. These services allow to perform routine interventions according to a pre-defined schedule, minimizing the risk of machine breakdowns, saving repairing costs and improving profitability. Often combined with our Production Security Parts package, Preventive Maintenance represents also the perfect chance to increase machine lifetime.

4) Spare Parts & Production Security Parts

The use of original parts is the best maintenance practice to protect machines availability and reliability. Our dedicated Spare Parts Team is at full disposal to offer all genuine spare parts needed to keep your machine in operation, reduce maintenance costs, improve efficiency and productivity.
5) Integrated Predictive Maintenance

Our Integrated Predictive Maintenance solutions help Customer to detect machine failures before they occur and to implement corrective actions in time to avoid accidental machine downtime. Brevetti CEA IPM solutions assure machine reliability during the time, reduce maintenance costs and increase equipment availability. The offer consists of two different solutions:

- **Offline IPM**: accelerometer sensors integrated into the machine for periodical condition monitoring of critical components;
- **Online IPM**: embedded 24 hours online condition monitoring system for automatic continuous supervision of critical components, directly on machine HMI.

6) Embedded Engineer

A Brevetti CEA Embedded Engineer provides full-time and on site labor to perform reactive and preventive tasks in continuous support of Customer manufacturing and engineering department. The service can include preventive maintenance, support / troubleshooting, condition monitoring, performance analysis, application development and much more. Having our multi-skilled highly qualified technician directly on site will grant numerous benefits:

- Obtain skilled resources to quickly and efficiently complete projects;
- Reduce response time to equipment malfunctions and unplanned downtime;
- Perform preventive maintenance as scheduled;
- Reduce risk of performance problems and premature equipment failures;
- Improve machine operator skills and internal troubleshooting capabilities;
- Supplement operations / maintenance staff during peak workloads;
- Fully protect Customer investment.

7) Knowledge Transfer Programs

Skilled staff grants high productivity results, cost reduction and process optimization. Brevetti CEA qualified experts are available to share and transfer their know how to Customer personnel. Our training programs are structured and developed according to specific needs and are aimed to transmit the required knowledge and skills to all participants.

8) Remote Parameterization

In addition to Help Desk Management and Remote Assistance, Brevetti CEA offers the innovative “Remote Parameterization and Validation module”. A complete solution that allows existing and new products parameterization, production optimization, false reject analysis preventing onsite technical intervention and machine downtime.
All For Safer Medicines

60 YEARS OF INSPECTION EXPERIENCE

Brevetti CEA is 100% focused on the design and production of inspection machines for injectable pharmaceutical products. Since the 1950’s it has been committed to supporting companies around the world in order to guarantee the use of safer medicines for patient health.

Across the world, Brevetti CEA references include a large variety of countries, customers and major international pharmaceutical groups. With more than 2,500 machines installed worldwide Brevetti CEA is internationally recognized as the inspection specialist.

Build. Innovate. Lead.

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