EZ-Fill® Platform to fasten Scale-up of Fill & Finish Manufacturing capacity for Vaccines

DVCNMN webinar

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• Stevanato Group at a glance
• Development Countries and Pharmaceutical Landscape
• EZ-fill® Vials - Ready-to-Use platform
• Benefits of EZ-fill® Vials on Fill & Finish Process
• Q&A
• Stevanato Group at a glance
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### Stevanato Group at a glance

What we proudly do

**SYSTEMS**
- Drug Containment Solutions
- In-Vitro Diagnostics and Medical Solutions & Drug Delivery Systems

**PROCESSES**
- Technologies & Manufacturing Equipment

**SERVICES**
- Analytical Services & Regulatory Support

**Unique combination of integrated capabilities addresses pharmaceutical customer needs through developmental, clinical and commercial phases**

- Reduced Time to Market
- Reduced Supply Chain Risk
- Reduced Total Cost of Ownership
- Consistent Quality
70 years of Expansion, Acquisition, Integration

The story we can tell

Stevanato Group was founded as Soffieria Stella

1949

Glass Conversion Manufacturing

1971

1993-2005

Acquired new facilities in Latina - Italy, and in Bratislava - Slovakia

2007-2013

EZ-fill® launched and Inspection systems acquired

Opened plant in Brazil

2007-2014

2016

Opened Greenfields in Mexico and China

2017

Commerical office in Japan

2018

Adding capacity in Italy

2019

2020

2021

2022 on-going

2023

Stevanato Group celebrates IPO and First Day of Public Trading on NYSE

Opening of new building in Italy with EMEA TEC center

Expansion of Facilities in US, China, and Italy; BARDA investment

Stevanato Group
Stevanato Group Today, 70+ Countries Served

Our present

16 sites
9 countries

☆ 3 sites
investments underway for EZ-fill® / Engineering

SOURCE: SG INTERNAL DATA
• Stevanato Group at a glance

• Development Countries and Pharmaceutical Landscape

• EZ-fill® Vials - Ready-to-Use platform

• Benefits of EZ-fill® Vials on Fill & Finish Process

• Q&A
New Trends are Driving Pharmaceutical Industry

More personalized diagnostics
From blockbuster to personalized medicine

Moving therapy
from Hospital to Home
Increasing of self-medication

Cost Explosion in Manufacturing
Rising pressure on prices

Growth in Biologics and Large Molecules
CAGR 10% per year vs. 4% of conventional drug Biosimilars in development

Increasing Regulatory Quality & Compliance
Fast global evolving regulatory environment

Growth in Emerging Markets
Meet global demands and local manufacturing

FOCUS ON PATIENT
Challenging Trends for Developing Countries

Market Trends

Cost Explosion in Manufacturing

Growth in Emerging Markets

Increasing Regulatory Quality & Compliance

Pharmaceuticals Needs for Fill & Finish

NEED TO REDUCE TOTAL COST OF OWNERSHIP (TCO)

REDUCE TIME TO MARKET

NEED TO INCREASE QUALITY

REDUCE COMPLEXITY

NEED TO INCREASE FLEXIBILITY
COVID-19 Pandemic highlighted the major need to access to infrastructures...

“[..] In terms of vaccine manufacturing capacity and efficiencies, considerations for facility sharing of fill and finish activities are in place and so is the provision of technical guidance on personnel competency improvement and personnel’s understanding of regulation related to GMP.”

Vaccine manufacturing workshop for South-East Asia and the Western Pacific regions: meeting report, 21-22 February 2022

“[..] The Latin America and Caribbean (LAC) region relies heavily on imported COVID-19 vaccines […], having the second lowest level of domestic supply after Africa.”

Expanding Emergency Vaccine Manufacturing Capacity in Latin America and the Caribbean

“[..] support from development financial institutions together with the private sector is crucial in supporting Africa’s industrial and sustainable development and countries need to be supported to expand their fiscal space during the ongoing pandemic. […] development partners need to actively promote human resource capacity and knowledge for the pharmaceutical manufacturing sector which requires highly skilled personnel.”

Strengthening Africa’s pharmaceutical industry: learning the lessons from COVID-19 | UNIDO

“[..] Clearly, the cost of setting up production would make the products locally produced in Africa more expensive than those imported from existing suppliers. But sustainable supply for years to come is worth the short-term cost.”

Scientists call on AU leaders to prioritise mRNA vaccine technology | Nation

Key importance in Developing Countries to **develop and strengthen local Capacity and related capabilities** in order to ensure access to vaccination
...which requires Pharmaceutical Companies to face new challenges in their growth

- Access to trained workforce for R&D and Operations activities
- Consistent access to utilities and WFI
- Access to Fill&Finish Capacity and Capabilities
- Efficiency in manufacturing and Fill & Finish to improve Return on Investments
- Proactive incorporation of regulatory guidelines

Quick industrial scale-up to reduce risk of dependance from external sources
How Stevanato Group can support Pharmaceutical Companies in Developing countries to overcome these challenges

Pharmaceuticals Needs for Fill & Finish

- NEED TO INCREASE FLEXIBILITY
- REDUCE COMPLEXITY
- NEED TO INCREASE QUALITY
- REDUCE TIME TO MARKET & QUICK INDUSTRIAL SCALE-UP
- NEED TO REDUCE TOTAL COST OF OWNERSHIP (TCO)

EZ-fill® Vials, Ready-to-Use Configuration

the proven advantages have turned the technology into an industry standard
• Stevanato Group at a glance
• Development Countries and Pharmaceutical Landscape
• **EZ-fill® Vials - Ready-to-Use platform**
• Benefits of **EZ-fill® Vials** on Fill & Finish Process
• **Q&A**
EZ-fill® vials Platform At a Glance | Producing Significant Value for Pharma Companies

- **EZ-fill® vials** are pre-washed, pre-sterilized and ready-to-fill vials available in both nested and tray configurations.

- **No Glass-to-Glass packaging** (Nest & Tub or Tray) to minimize possible scratches or other glass defects during shipment, aligned with ISO 21881.

- **EZ-fill® Nest & Tub** configuration is compatible with **multi purpose fill & finish lines**.

- **EZ-fill® Tray** is compatible with a wide range of fill&finish process, from **manual** to **automatic**, up to **high speed fill&finish lines**.

- **EZ-fill® packaging**, both Tray and Nest & Tub, can be packed with either **single** or **double steribag**.

- **EZ-fill® platform** is an **open platform**, currently used by other primary packaging suppliers.
Stevanato Group Process: from Bulk to EZ-fill®

**Glass Tubing**

**Converting Process**

**Vial Bulk Delivery**

**Vial**

**EZ-fill® Process**

1. Washing
2. Depyrogenation
3. Nesting & Tub insertion, Tray loading
4. Sealing & bagging
5. Sterilization

**Pharma Companies Ownership**

**Washing Depyrogenation Sterilization**

**Fill & Finish**

**EZ-fill® Delivery**

**Packaging Supplier**

**Shipment to Pharma Site**

**Pharma Site**

**EZ-fill® (No Glass-to-Glass)**

**Strong mitigation of the risk of breakages and cosmetic issues**

**Filling/Inspection Operations**

**Tray**
Ready-to-Use Secondary Packaging configurations can support a wide range of Pharmaceutical Needs

- **EZ-fill® Vial in Tray**

  - **INCREASE QUALITY**
  - **REDUCE COMPLEXITY**
  - **INCREASE FLEXIBILITY**

- **EZ-fill® Vial in Nest&Tub**

  - Configuration to fill vials, cartridges, syringes with a unique filling machine (combi lines)

  Courtesy of Optima

**EZ-fill®** is suitable for filling applications from LOW to HIGH SPEED

Courtesy of Syntegon
Advantages of EZ-fill® Nest
Mechanical Support of Glass Containers

Mechanical support from the bottom
- No stresses generated on glass
- Possibility of removal and re-insertion of the container on the same secondary packaging without risks or waste of product
- No particle generation due to friction
Advantages of EZ-fill® Tub
Optimized Tub Dimensions

Optimized Tub to increase pallet density with low transportation and warehouse costs

Stevanato Group solution is currently validated in existing RTU filling lines
**EZ-fill® Vials in Nest & Tub**

Secondary Packaging Configuration

- **Sealing Lid (Tyvek lid)**
- **Insert Liner (Tyvek sheet)**
- **Glass Vials (borosilicate type I)**
- **Vials in Plastic Nest:** no glass to glass contact
- **Plastic Tub**

- **Steribag**
- **Tub protected by a single or double protective bag/s (Steribag/s)**

- **Alveolar PP sheet**
- **N&T**
- **Label**
- **Box**

- **Box composition**
- **Pallet composition**

- **Strapping**
- **Cardboard corners**
- **Label**
- **Layers of boxes**
- **Alveolar PP sheet**
- **Pallet**
Ready-to-Use Secondary Packaging configurations can support a wide range of Pharmaceutical Needs

**EZ-fill® Vial in Tray**

- Manual filling at laboratory scale
- Industrial lines filling RTU Vials according to existing process (manual/automatic)

**EZ-fill® Vial in Nest&Tub**

- REDUCE TIME TO MARKET & QUICK INDUSTRIAL SCALE-UP
- REDUCE TOTAL COST OF OWNERSHIP (TCO)

Stevanato Group EZ-fill® is suitable for filling applications from LOW to HIGH SPEED

*Courtesy of Syntegon*

*Courtesy of Optima*
Advantages of EZ-fill® Tray
Vial Different Orientations According to Filling Requirements

Neck-up Vial Solutions for Laboratory Scale
- Direct filling of vials inside Tray under laminar flow

Upside-down to load in a line with conventional filling system
- De-traying
- Filling
EZ-fill® Vials in Tray
Secondary Packaging Configuration

- Sealing Lid (Tyvek lid)
- Insert Liner (Tyvek sheet)
- Glass Vials (borosilicate type I)
- Vials in Plastic Tray: no glass to glass contact
- Tray protected by a single or double protective bag/s (Steribag/s)

- Alveolar PP sheet
- Tray
- Label
- Box

Box composition

- Strapping
- Cardboard corners
- Strapping
- Label
- Layers of boxes
- Alveolar PP sheet
- Pallet

Pallet composition
Proven technologies available in the market to guarantee processability of EZ-fill® Vials in Fill & Finish

The technology used for the infeed of the packaging can impact the timeline and costs for the adoption of EZ-fill® vials platform

Manual De-Traying of the vials
Semi-Automatic De-Traying of the vials
Automatic De-Traying of the vials

Stevanato Group can support pharmaceutical industry in both approaches, leveraging the benefits of EZ-fill® vials to reduce the risk of particles generation and human intervention

Note: SG EZ-fill® Tray packaging is the preferred solution for retrofit; Nest & Tub packaging can be used as well, impacting timelines, costs and throughput of the process.
Some examples of de-traying of EZ-fill® vials

MANUAL DE-TRAYING WITH DEDICATED TOOL

SEMI-AUTOMATIC DE-TRAYING
• Stevanato Group at a glance
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Benefit of EZ-fill® vials | Improved integrity and safety of the medicine

- Reduced risk of rejections, complaints and recalls
  - Reduced risk of glass particles
  - Improved cosmetic quality and reduced critical defects

Reduced risk of contamination
- Low particles contamination, lined up with the updated regulatory guidance
- Improved mechanical resistance (mitigation of glass breakage)
- Higher process efficiency (lower scrap rate after AVI)

INCREASE QUALITY
INCREASE FLEXIBILITY
REDUCE COMPLEXITY
Benefit of EZ-fill® vials
Fill & Finish process design to reduce footprint and improve quality

Bulk Traditional Process

A. Infeed module (Bulk material)
B. Washing module
C. Depyrogenation oven
D. Rotary table/Buffer station
E. Filling module
F. Stoppering module
G. Crimping module
H. Visual inspection module
I. Rejection/Recirculation
L. Finished products

ISO 7 / Class A
ISO 5 / Class A
ISO 8 / Class C
ISO 7 / Class B

EZ-fill® Aseptic Process

1. Pass/box system
2-3. Debagging module
4. Delidding & Detraying module

EZ-fill® Vials Benefit can be evaluated focusing on the infeed of primary packaging on the process
Benefit of EZ-fill® vials
Reduction of risk of breakages/rejections and improved efficiency

Bulk Traditional Process

- ISO 8 / Class C
- ISO 5 / Class A
- ISO 7 / Class B

EZ-fill® Aseptic Process

- ISO 8 / Class C
- ISO 5 / Class A
- ISO 7 / Class B

- Reduction of risk of breakages and rejections given the impact of Depyrogenation on cosmetic quality.

- Potential increase in the throughput of the line by removing the complexity generated in handling washing and depyrogenation modules.

NEED TO INCREASE QUALITY
REDUCE COMPLEXITY
NEED TO REDUCE TOTAL COST OF OWNERSHIP (TCO)
Benefit of EZ-fill® vials
Reduction of Clean Room area and no need for Washing and Depyrogenation

Bulk Traditional Process

- ISO 8 / Class C
- ISO 5 / Class A
- ISO 7 / Class B

EZ-fill® Aseptic Process

- ISO 8 / Class C
- ISO 5 / Class A

- By reducing Clean Room area reduced in Grade C and Grade B and removing the need of Washing & Depyrogenation, it is possible to reduce initial investment as well as the time for start-up.

- Less Clean Room area and no washing and depyrogenation reduces validation activities (cost and timeline) and utilities consumption.

• REDUCE TIME TO MARKET & QUICK INDUSTRIAL SCALE-UP
• REDUCE TOTAL COST OF OWNERSHIP (TCO)
Benefits of EZ-fill® vials
Benefits of EZ-fill® can be evaluated also at Manufacturing site scale

• Depyrogenation oven impact highly the space required for Fill & Finish operations*.

• Reduction of the footprint of Fill & Finish department due to lower footprint of equipments and clean room areas.

• Reduction of the timeline for the department set-up and of the space & investments required.

*The difference in terms of footprint is based on (i) F&F Equipment supplier, (ii) Industrial Set-up (washer and tunnel connected to the filler or not connected to the filler), (iii) Type of RTU F&F equipment.
Benefit of EZ-fill® vials
No need for Water For Injection loop for Fill & Finish equipments

• WFI Loop and infrastructure related to Fill & Finish can be reduced.
• Reduction of WFI results in reduction of water waste, reduction of initial investment and utilities costs.
• Reduction of the timeline for the department set-up and of the space & investments required.

REDUCE TIME TO MARKET & QUICK INDUSTRIAL SCALE-UP
REDUCE TOTAL COST OF OWNERSHIP (TCO)
Benefit of EZ-fill® vials
No need for oven Start up in production for Fill & Finish equipments

- Production start-up for the depyrogenation oven to reach correct temperature curve can take up to 4 hrs
- Avoiding depyrogenation oven results in reduction of initial investment and utilities costs.
- Reduction of the timeline for the department set-up and of the space & investments required.

REDUCE TIME TO MARKET & QUICK INDUSTRIAL SCALE-UP
REDUCE TOTAL COST OF OWNERSHIP (TCO)
Benefit of EZ-fill® vials
Same packaging configuration across different stages of Fill & Finish design

- Same Fill & Finish Equipment across from Clinical to Commercial Manufacturing
- No change on the primary packaging from Discovery to Commercial
- Same Fill & finish procedures from Clinical to Commercial Manufacturing
- Possibility to plan resources and workforce in advance before Commercial Manufacturing
- Reduced investment in Fill & Finish Equipment
- Streamline container characterization and validation activities
- Reduced training required for operators
- Reduced risk related to lack of trained workforce available

From the early stages to industrial production.
The advantages to Fill & Finish operations by EZ-fill® vials impacts positively not only on set-up time, but also on Total Cost of Ownership.

Average data collected by Stevanato Group; the variance is due to factors such as (i) productivity rate, (ii) breakages and rejections rate, (iii) filling line utilization, (iv) volumes, (v) country, (vi) Industrial Set-up (washer and tunnel connected to the filler or not connected to the filler).

Average reduction of TCO (including enabled value) from Bulk vials to EZ-fill® vials:
- ~5-10% Clean room space and utilities
- ~15-20% Washing process
- ~10-15% Depyrogenation process
- ~55-70% Improved quality and productivity
- ~5-10% Other elements

~20-50%

Stevanato Group can support Pharma Companies in evaluating how using EZ-fill® vials configuration can reduce cost of upstream operations as well as timelines for Fill & Finish capacity with dedicated tools.

Note: 1) Average data collected by Stevanato Group; the variance is due to factors such as (i) productivity rate, (ii) breakages and rejections rate, (iii) filling line utilization, (iv) volumes, (v) country, (vi) Industrial Set-up (washer and tunnel connected to the filler or not connected to the filler).
Key Takeaway on EZ-fill® vials platform

**EZ-fill® vials** is the solution for **fasten the industrial scaled-up** for Fill&Finish solutions considering the following topics:

- Reduction of risk of contamination
- Reduction of breakages, rejections and improved cosmetic quality
- Improve the overall process effectiveness
- Reduction of utilities consumption
- Reduction of initial CAPEX
- Reduce Time To Market & Quick Industrial Scale-up
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We’re looking forward to meeting you at DVCMN Annual Meeting – Booth 5

DCVMN Annual Meeting
19 - 21 September 2023
Cape Town - South Africa

Don't miss the opportunity to meet us during the DCVMN Annual Meeting.
Visit us at the Stevanato Group tabletop and join our corporate presentation during the conference session!
Discover how we exploit our range of services, products, and technologies to offer integrated solutions for the pharma and healthcare industry.

Speech:
Thursday, September 21st - 01:30 pm to 3:00 pm (SAST)
Andrea Zambon – Corporate Business Development
SESSION:
“Leveraging Innovative Platforms for Novel Vaccines”

Book a meeting with us