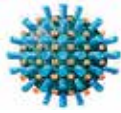
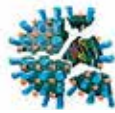


# YOUR VACCINE PRODUCTION PARTNER

## CLASSIFICATION OF VACCINES



Whole virus



Split virus



Subunit (surface antigen)



Live attenuated



Bacteria

• **VIRAL**

• **BACTERIAL**



**Attenuated** ("Live")

**Inactivated** ("Killed")

- Complete
- Fraction

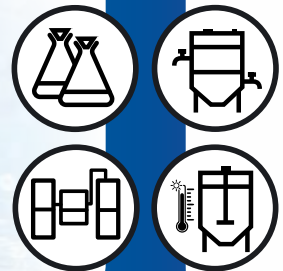
Generally to preserve the life of the antigen

Generally when liquid solution has low stability

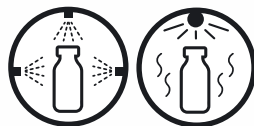


## INJECTABLE VACCINE PRODUCTION PROCESS FLOW

Production & Purification of Antigen



LYOPHILIZATION



Washing

Depyrogenation



Filling



Formulation & Blending

Capping



External washing

Inspection



Secondary Packaging



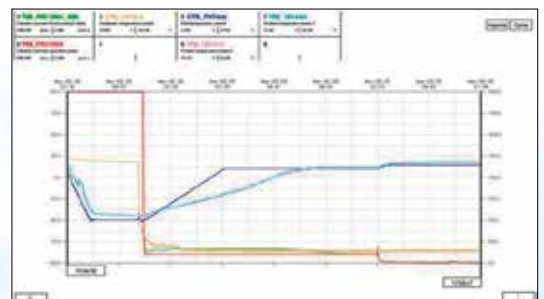
### LYOPHILIZATION PROCESS KEY ADVANTAGES:

- Suitability for temperature sensitive and thermolabile products
- Sterile production
- Stability in time (long shelf life)
- Stability at standard environmental conditions
- Enhanced regulatory stability requirements (37°C for 7 days)
- Keeping desired potency (titer)
- Easy and fast reconstitution



## VACCINE LYOPHILIZATION PROCESS

- Optimized cycles to maximize production output
- Titer requirement fulfilment
- Efficiency and quality through Controlled Nucleation
- Use of Natural Gases maintaining the performance
- Combination of efficiency/productivity without compromising safety



- Grade A (ISO 5) Unidirectional laminar airflow and negative pressure for product, operator and environment protection
- Standardized models and also tailor-made solutions
- Bag-In Bag-Out filtration system option
- Several standard accessories (containment screens, work benches,...)

**Downflow  
booths**

**VACCINE PRODUCTION  
EQUIPMENT**

- Dry heat sterilizers for depyrogenation
- Moist heat sterilizers for infeed sterilization, decontamination (dedicated effluent discharge/CIP) and terminal sterilization
- Automatic Loading/Unloading integrated solutions

**Sterilizers**



**Isolators /  
c-RABS  
o-RABS**

- Grade A (ISO 5) unidirectional laminar airflow
- Physical barrier for product protection
- Isolator suitable for product & operator protection
- Customized solutions to integrate with the complete line
- Bio-decontamination systems available
- Sterility Test isolators

**Pass-Boxes**

- Safe pass-through for transferring materials between classified areas
- Standardized models and tailor-made solutions
- Bio-decontamination systems available

**+ OTHER TELSTAR SERVICES :**

- **Complete line solutions**
- **Lyophilization and Sterilization process optimization/development services**
- **Consultancy, Engineering, Construction, Validation, Customer Service**
- **Calibration services**
- **Customer Service (including Equipment upgrade, retrofit & refurbishment)**



**Lyophilizers**

- Automatic Loading/Unloading integrated solutions
- Cleaning and Bio-decontamination (CIP/SIP) cycles
- Product, operator and environment protection
- Effluents suitable treatment



[www.telstar.com](http://www.telstar.com)

WE ARE SOCIAL follow us on   

