



Transitioning from multi-use to single- use technologies from a manufacturer's perspective

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Outline

- Introduction
- Case study – what was changed?
- Benefits and disadvantages of single-use
- Drawings versus real life
- Requirements for any material



ALK at a glance

Product Supply and production sites



Post Falls, USA

Source material
(Pollen, house dust mites)



Oklahoma City, USA

Auxiliary products
(Diluents, vials and moulds)



New York, USA

US distribution
(Bulk extracts for the US market)



Hørsholm, Denmark

Production of injectables
Production of drug substance
Global functions



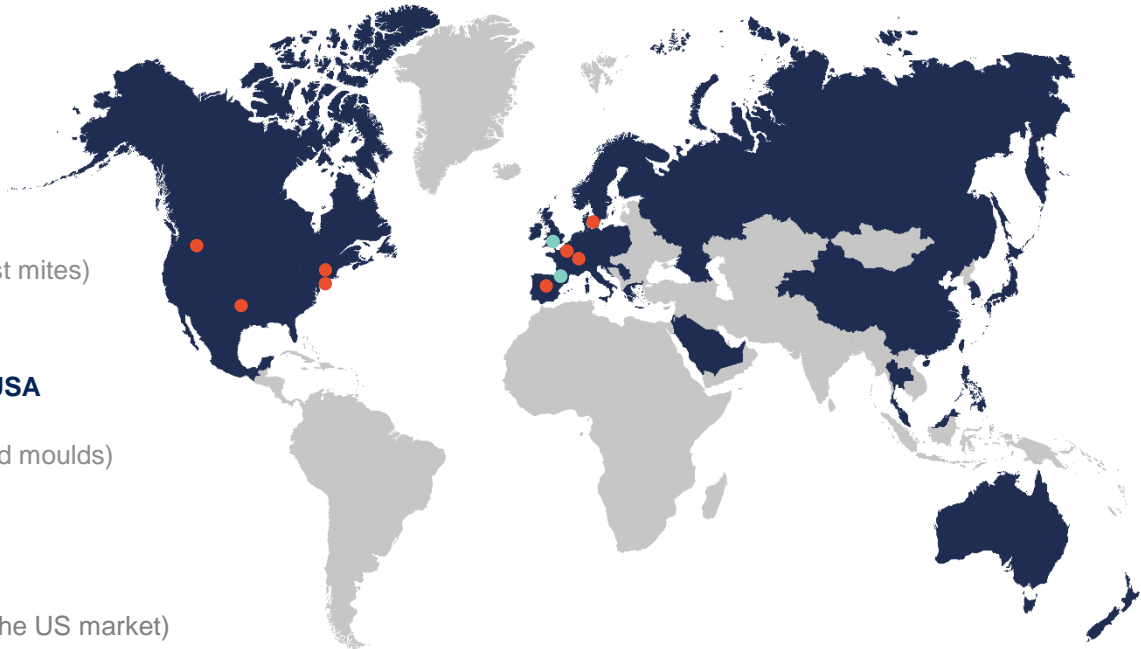
Vandeuil and Varennes, France

Production of drug substance
Production, pack and distribution
for France



Madrid, Spain

Production of diagnostics
Assembly of Jext®
QC for drug product
Pack and distribution



● ALK presence ● Production sites ● Key global CMOs

Case study

From multi-use to single-use technology

- Increased scale
- Manufacture in closed systems
- Implementation of RABS-technology



Open process to closed process

What was required?

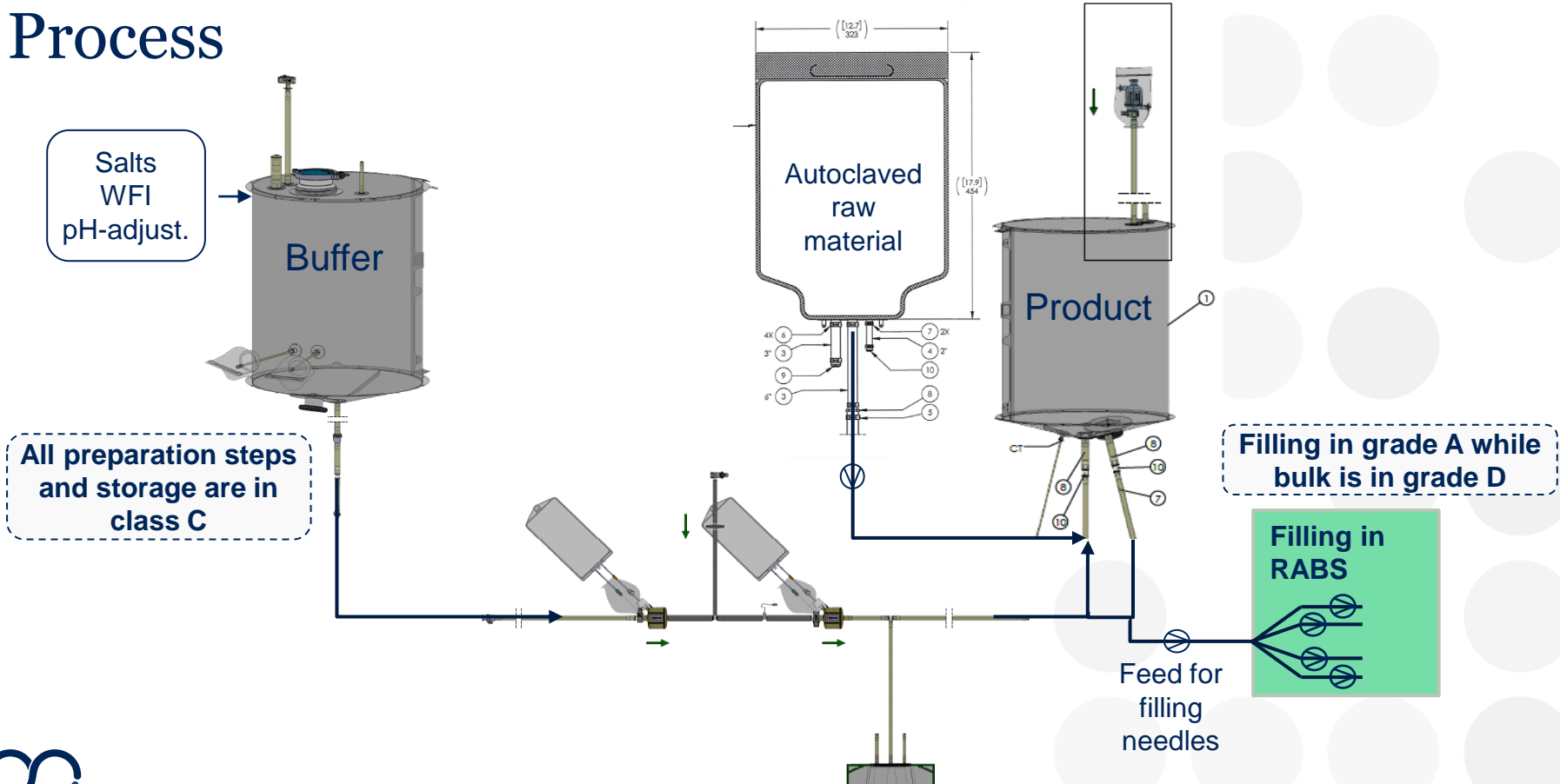
Open aseptic process



Closed process



Process



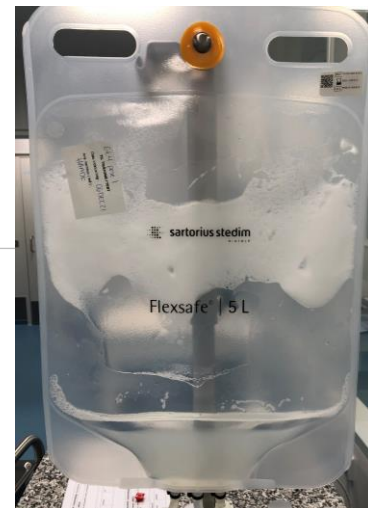
What was changed?

From glass to single-use containers

Multi-use



Single-use



What was changed?

Stainless steel connections to single-use tubing

Multi-use

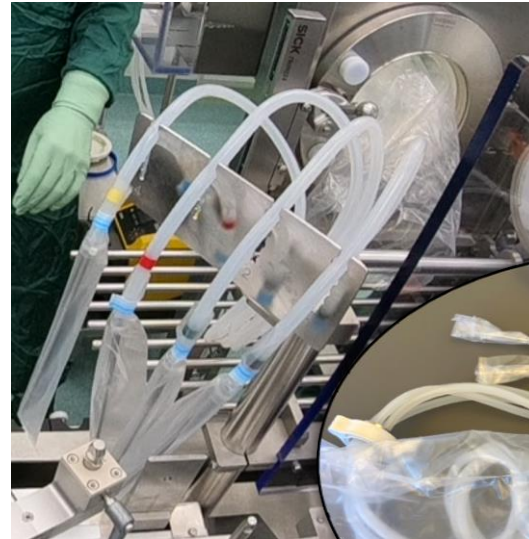


Tubing cut, washed, dried, connected and sterilised in house.

Metal parts are multi-use



Single-use

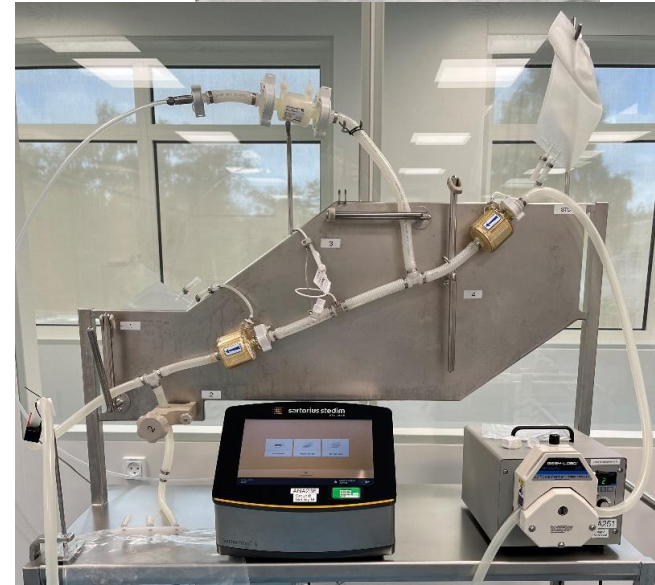


All parts are cut, cleaned, connected and sterilised by supplier



Benefits when choosing single-use

- All parts are cut, cleaned, connected and sterilised by supplier
 - Reduced in-house cut, wash, connection and sterilization
 - reduced number of operators
 - Reduced validation of wash and sterilisation
- Manufacture in closed systems possible without CIP/SIP

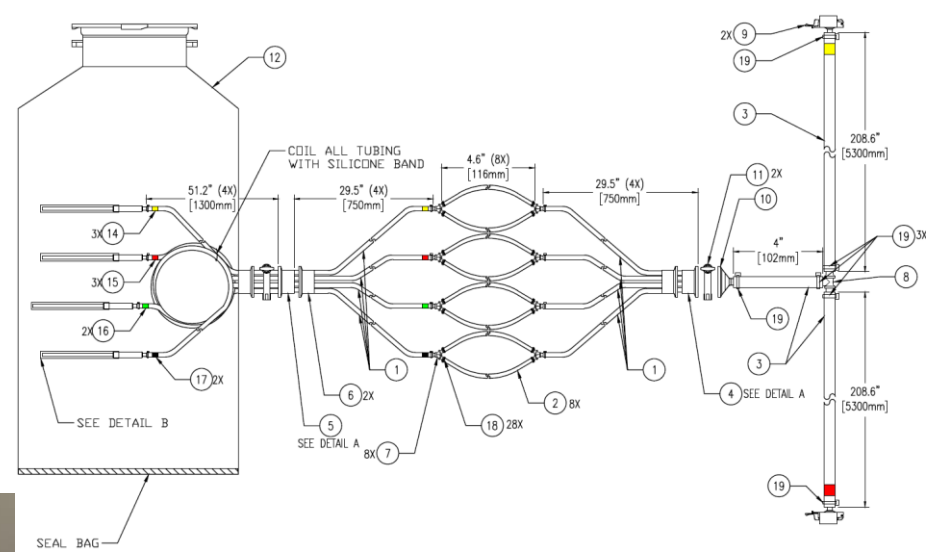


Challenges when choosing single-use

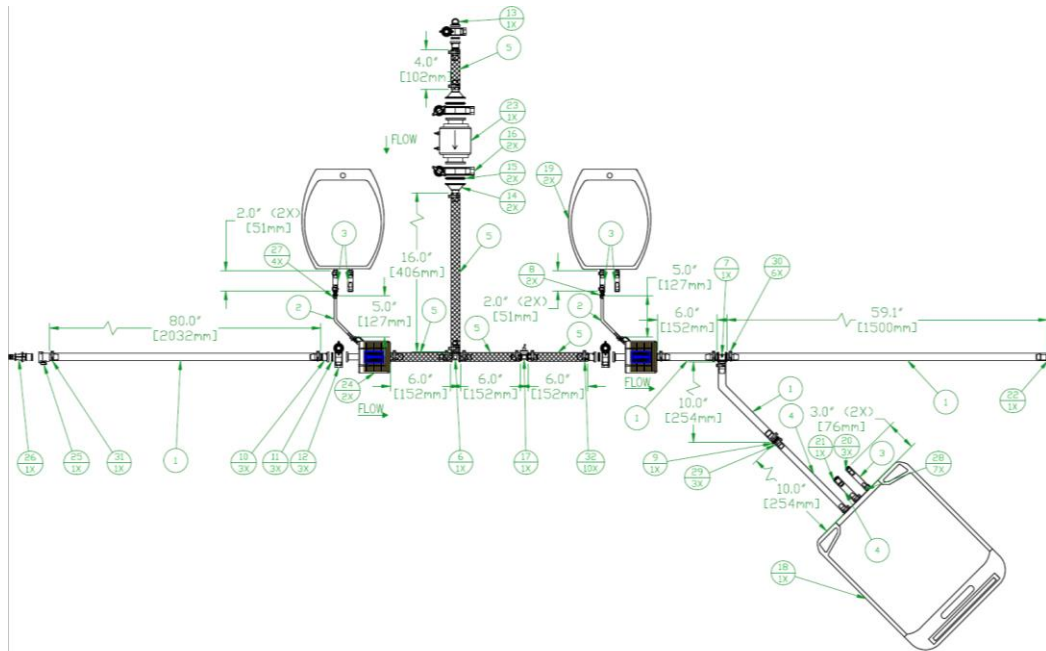
- Long leadtime – at least 20 weeks, up to 70 weeks seen
- Complex supply chain – new requirements for audits
- Takes up lots of space in warehouse and facility
- Increased time and requirements for material transfer
- Continuous update of components
- Requires additional or adjusted equipment, e.g.
 - Tube welder
 - Tube sealer
 - Balance adjusted to fit bags



Drawings vs real life



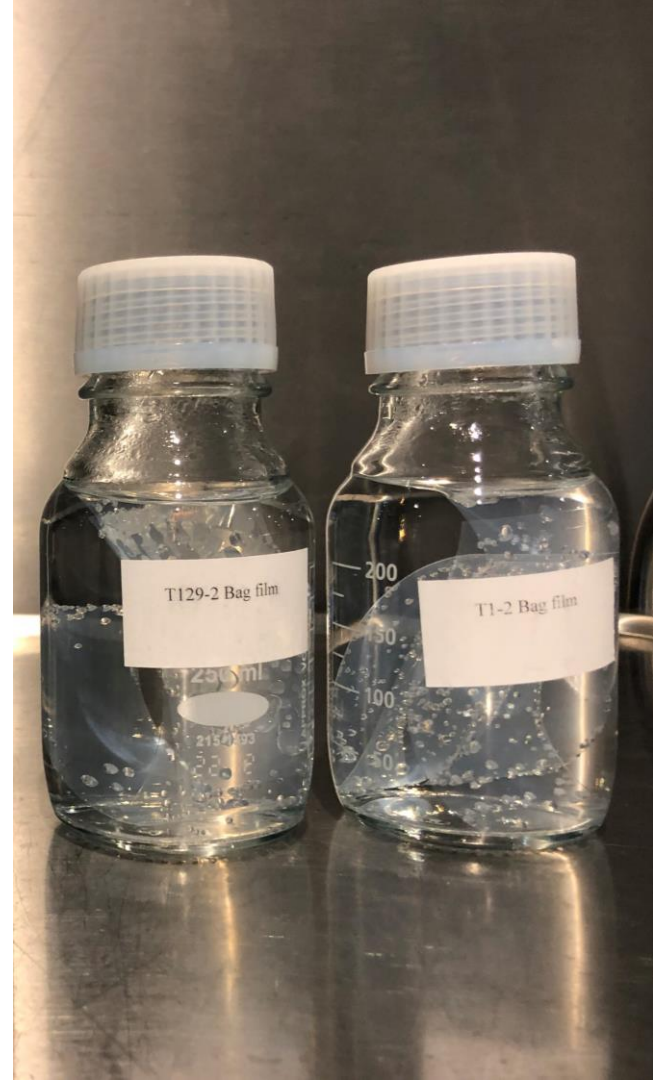
Drawings vs real life



Requirements for any material

What should be studied for all materials?

-
- Interaction with product (adhesion etc.)
 - Extractables & leachables
 - Elemental impurities
 - Other impurities (TSE/BSE, particles, endotoxin, PFAS, etc.)



Summary

It's a whole new world

Manufacture in closed systems made possible

- No CIP/SIP needed

Supply chain & audit

- Manufacturing site
- Sterilisation site

Daily handling

- Space in warehouse
- Fragile systems



Testing and implementation takes time

- New equipment
- Process development
- Product adsorption
- Leachables & extractables
- Particle contamination

Questions?

