

Science & Technology of fast-moving home & personal care consumer goods

University of Patras
Mar 2025

1. Company Intro
2. NPD/EPD Process
3. Processing
4. Production
5. Sustainable design

Our history



Sarantis Group at a glance

A regional multinational consumer products company

Strong International Presence

Representing **67%** of total turnover

Subsidiaries in **12** countries, exporting to **50+** countries

60 years of presence

100+ brands of high quality and recognition in Home Care, Personal Care and Beauty

Own brand portfolio **70%** of sales

Top supplier in the FMCG sector
Strong distribution network covering

110.000+ PoS
90% based on KAs

Long term strategic partnerships

with **25+** international consumer companies

A group of **3.200** people

8 Production facilities operating under the strictest quality & safety criteria

Healthy financial position.

In 10yrs: **2x** sales growth & **3x** net income growth

FY'23 Sales at **482 mil.**

FY '23 Net Income at **43,6 mil.**

High Free cashflow generation supporting the Group's strategic growth plan

Geographical presence

Poland

Biggest country in terms of top line
Home care solutions hub
Expansion in Personal Care and Beauty

Ukraine

Resilient business
Future growth
Development opportunity

Greece

Multi-category & multi- channel
Significant EBIT generator
Leading share in most of the categories

Strong distribution network

Customer satisfaction is important in maintaining a strong distribution network and our aim is to build strong partnerships that create value for both our business and our customers' businesses.



POINTS OF SALES	GREECE	POLAND	ROMANIA	SERBIA	CZECH REPUBLIC	BULGARIA	HUNGARY	NORTH MACEDONIA	SLOVAKIA	BOSNIA	PORTUGAL	UKRAINE	TOTAL
Total Mass Market	8,378	22,028	11,821	5,162	6,239	1,478	9,095	1,010	4,614	860	2,230	32,293	105,208
OTC through PHARMACY SHOPS	2,144	-	3,478	653	-	-	-	45	-	-	-	-	6,320
SELECTIVE	237	-	179	-	-	149	35	-	-	-	-	-	600
TOTAL	10,759	22,028	15,478	5,815	6,239	1,627	9,130	1,055	4,614	860	2,230	32,293	112,128

We aim to be the preferred supplier for all our customers by focusing on :

- ✓ Building strong customer relationships.
- ✓ Quality and innovation behind our propositions.
- ✓ Offering a well diversified product portfolio addressing consumers' needs.
- ✓ Excellence in marketing, merchandising, in-store presentation and experiences.
- ✓ Excellence in execution.

TOP SUPPLIER OF KEY ACCOUNTS



8 countries – 2,950 POS



3 countries – 1,969 POS



7 countries – 109 POS



2 countries – 1,297 POS



4 countries – 363 POS



1 country – 287 POS



2 countries – 3,906 POS



1 country – 459 POS



1 country – 74 POS



1 country – 267 POS



1 country – 688 POS



1 country – 323 POS



2 countries – 8,040 POS



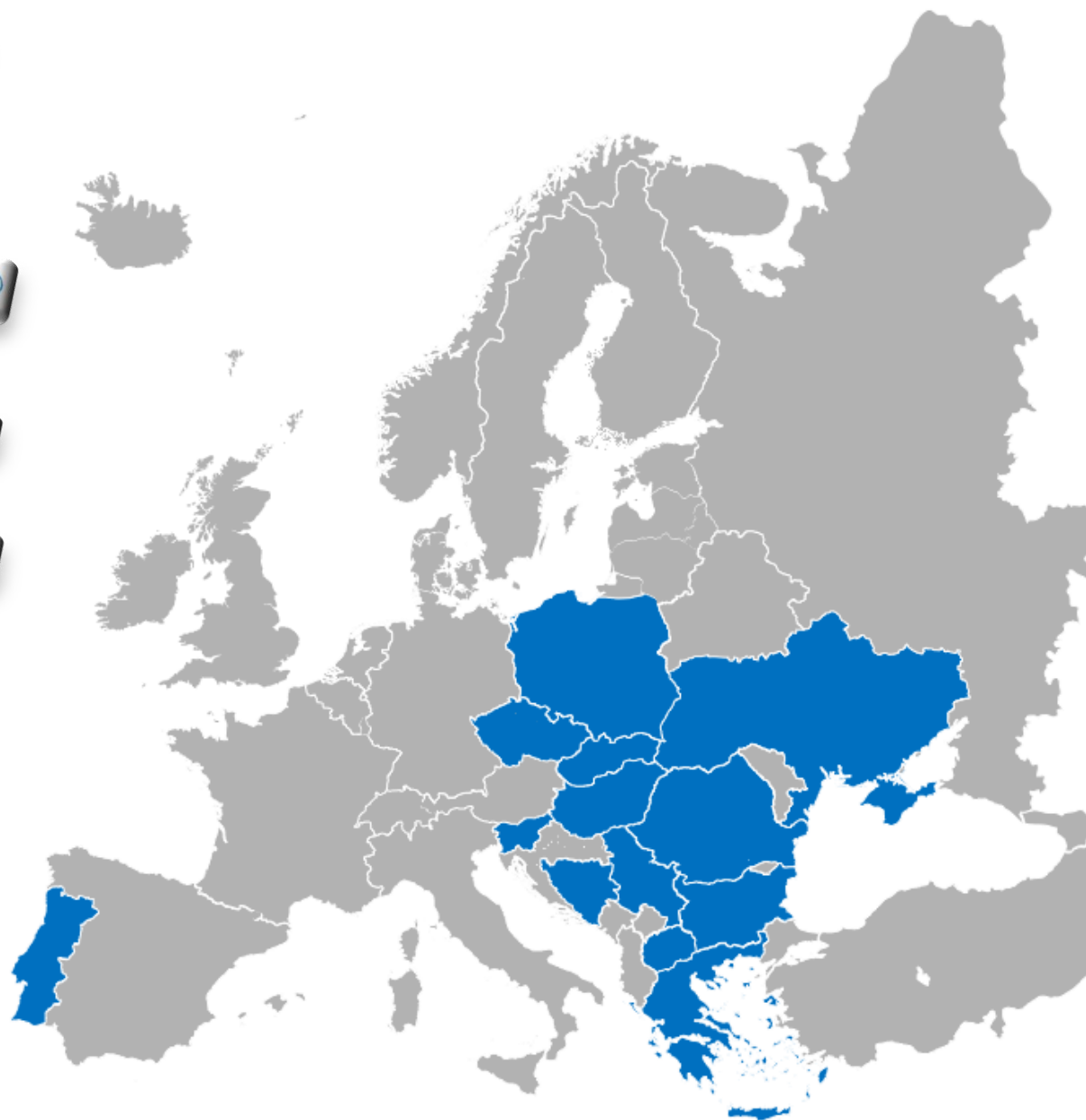
3 countries – 430 POS



1 country – 4,063 POS



1 country – 830 POS



1 country – 1305 POS



1 country – 1119 POS



1 country – 418 POS



1 country – 310 POS



8 countries – 1096 POS



2 countries – 897 POS



2 countries – 66 POS



2 countries – 483 POS



3 countries – 1,967 POS



6 countries – 1,542 POS

Supply manufacturing evolution

1999



2015



2023



2002



Establishment of
Greek Factory
Cosmetics
Food packaging

Establishment of 1st
Polish Factory in
Pruszkow Poland
Food packaging



Acquisition of 2nd
Polish Factory at
Poznan
Garbage Bags

2018

Acquisition of
Ukrainian
Factory in
Kaniv



Full rebuild of
Poznan Factory in
Poland

2024

Acquisition of 4 Factories
of Stella Pack
2x In-house recycling
Garbage bags
Food packaging

8 factories under our Geography
Two of them from recent acquisition are dedicated to recycling inhouse capabilities

Beauty & Personal Care R&D Center in Greece

Enhanced Innovation capabilities



In-house formulation & pilot production



Strategic alliance with top cosmetic ingredients suppliers



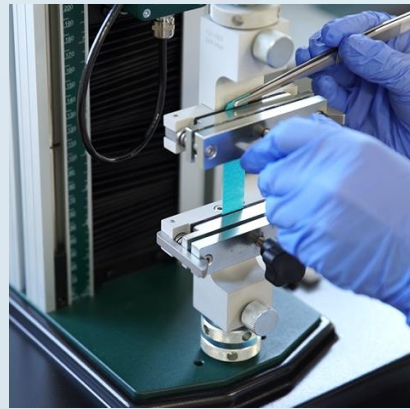
Garbage Bags R&D Center In Poznan, Poland

State of the art Garbage Bags Innovation Centre



Thickness consistency

In-house granule mix innovation & pilot production



Color verification



Recycled material manufacturing process optimization



Tensile strength



Packaging Innovation & Optimization Center

Centralized Packaging
Centre of Excellence

Pack Design

Product safety

Primary &
Secondary Pack
Innovation

Sustainability
driven initiatives

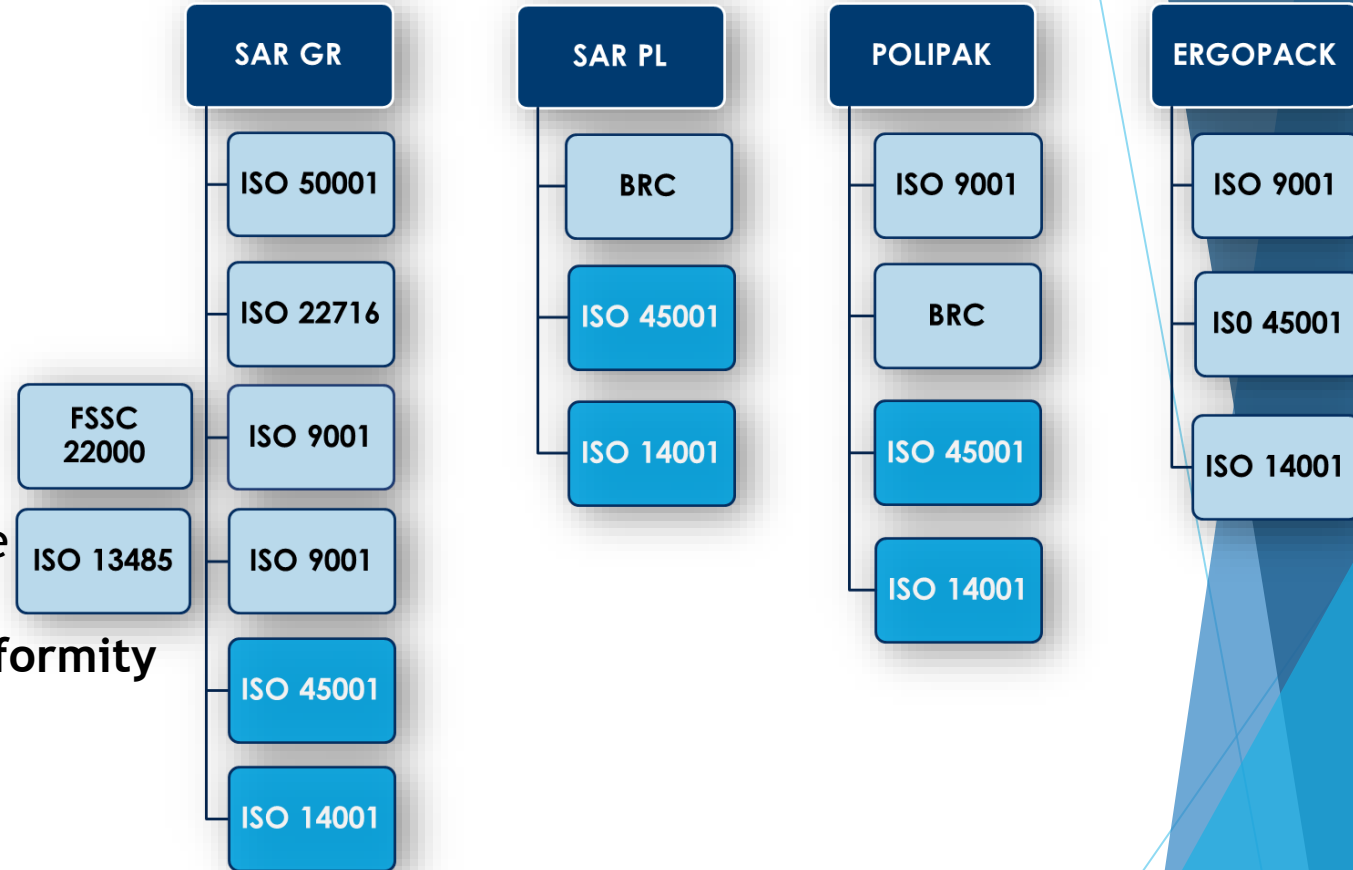


Box compression



Climatic chambers

- ❑ **Certified Operations** across Production and Distribution sites
- ❑ **Continuous Internal Audit plan**
- ❑ **Harmonized Site & Country specific QA metrics**
- ❑ **Actionable Consumer Satisfaction** measurement
- ❑ **Risks Prevention** through SOPs and Management
- ❑ **Fully equipped GLP standard QC labs** on every site
- ❑ **Raw, pack, semi-finished and finished goods conformity**
- ❑ **On-site in process production control**
- ❑ **Sustainability** to GRI standards
- ❑ **Vendors Approval & Management** process
- ❑ **Organizational Quality Culture Improvement & Training**



100+ brands of high quality and recognition

Strong brand portfolio

Personal Care

44%



SM & HM & Local Groceries



Home Care

44%



SM & HM & Local Groceries



Health Care

2%



Pharmacies



Luxury Cosmetics

10%



Perfumery shops



Oinofita site

COSMETICS



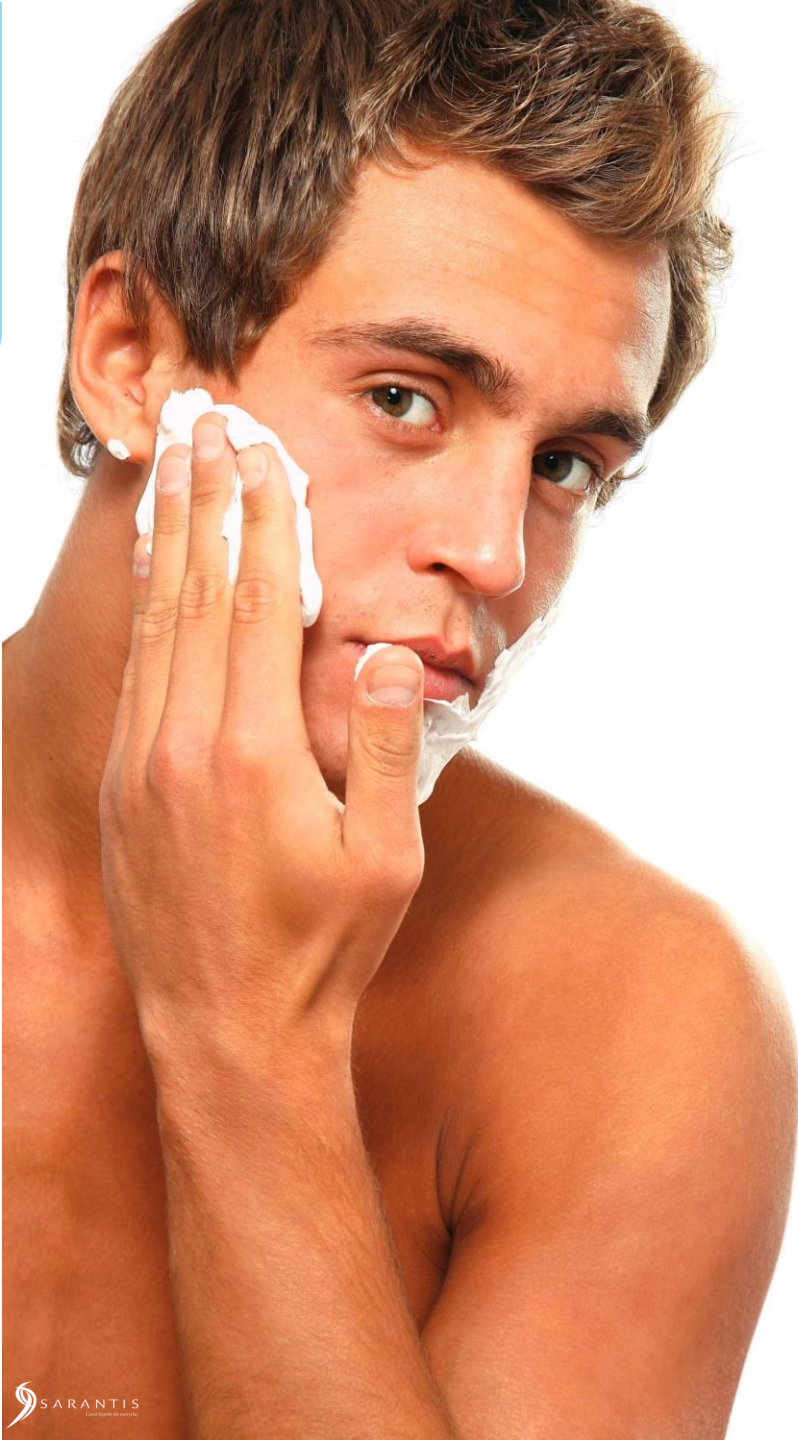
Product Categories

- Shower gels, Bath foams & liquid soaps
- Hair Care (Shampoos, conditioners, masks, oils, creams)
- Skin care (Creams, Lotions, Cleansing lotions, Oils)
- Sun care products (Milks, milk sprays, oils, creams)
- Deodorants (Roll on)
- Perfumery Products (Eau de Toilette, After Shave Lotions, Body Fragrances/Mists)

Own Brand Portfolio – Personal Care

Skin care, Sun care, Hair & Body Wash





Own Brand Portfolio – Personal Care Male & Female Fragrances, DEOs, Shaving



Own Brand Portfolio – Household Products
Food Packaging, Garbage bags, Cleaning Tools



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NPD PROCESS

Market Insights
Technology Insights
Competitor Intelligence



Claims
Ingredients/ Pack
Costing



Prototypes
Pilot production
Full production

CLEAN

FOAM

FRESHNESS

SENSORIALS

PROTECTION- SPF

TANNING

HYDRATION

ANTI-AGEING

HEALING

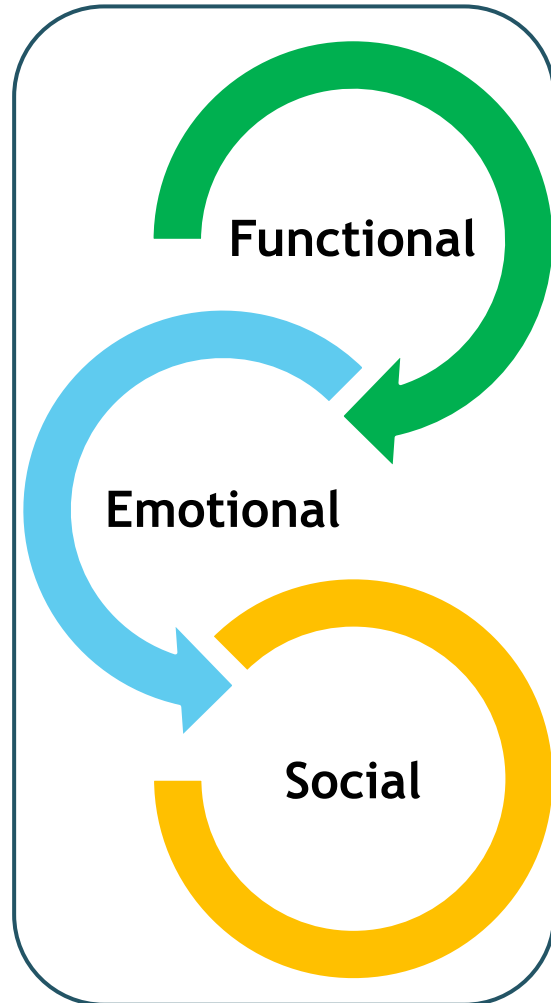
ANTIPERSPIRANT

MICROBIOME BALANCE

ENVIRONMENT

NPD/EPD PROCESS- CONSUMER NEEDS

CONSUMER BENEFITS

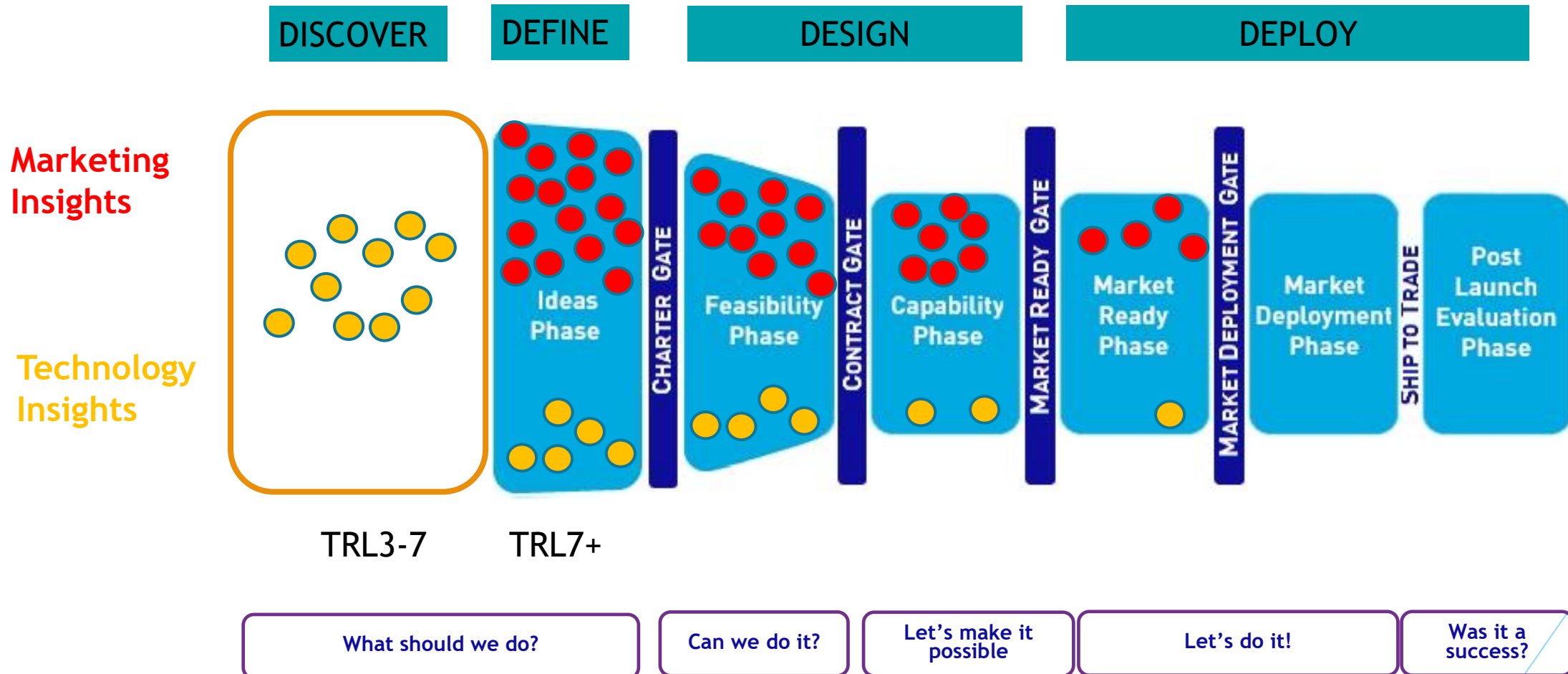


Price, less effort, works better, longer lasting, hydrates, stops sweat, reduces wrinkles, etc.

Feel free, stay in control, maintain confidence, be yourself, feel liked, etc.

Sense of belonging, socially correct, etc.

NPD/EPD PROCESS- Innovation Funnel



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What is process

To derive a saleable product requires 3 elements

Something to
put it in
THE PACK

Something to
make it from
THE RECIPE

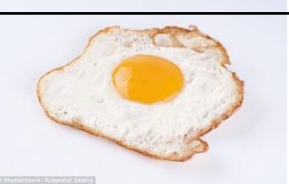
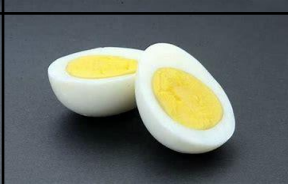
Some
assembly
instructions
THE PROCESS





Why is process important?

The Assembly instructions dictate the structure, appearance, physical properties & in-use attributes of the product: consider processing an egg

Whole or Broken	Broken	Broken	Whole	Whole	Broken	Broken	Whole
Temp (C)	200	100	100	100	100	200	37
Mixing	-	high	-	-	-	high	-
Time (minutes)	5	5	3	10	3	5	30,000
Product							
	Fried	Scrambled	Boiled	Hard boiled	Poached	Omelette	Chick

The taste and feel of your breakfast depends on processing



What is the function of the Process Group

- To develop **assembly instructions** (the process specification)
- To **translate lab-scale to production scale**, maintaining microstructure, appearance and the same consumer performance
- We need **an intermediate scale** (pilot scale), optimising efficiency and minimising cost.
- We consider **equipment design**, process **safety** and **hygiene** and **cleaning**



0.5
-10kg

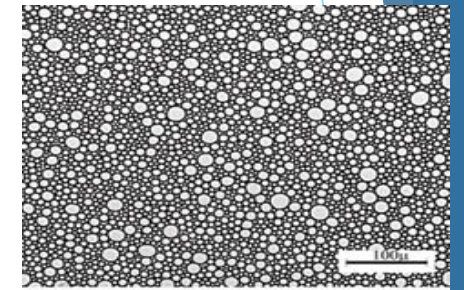


100
-300kg

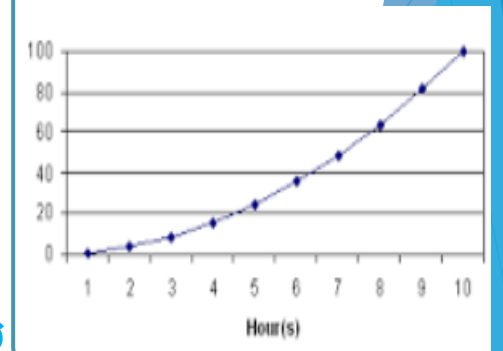


2000
-10000kg

Maintain
microstructure



&
performance





Process Specifications

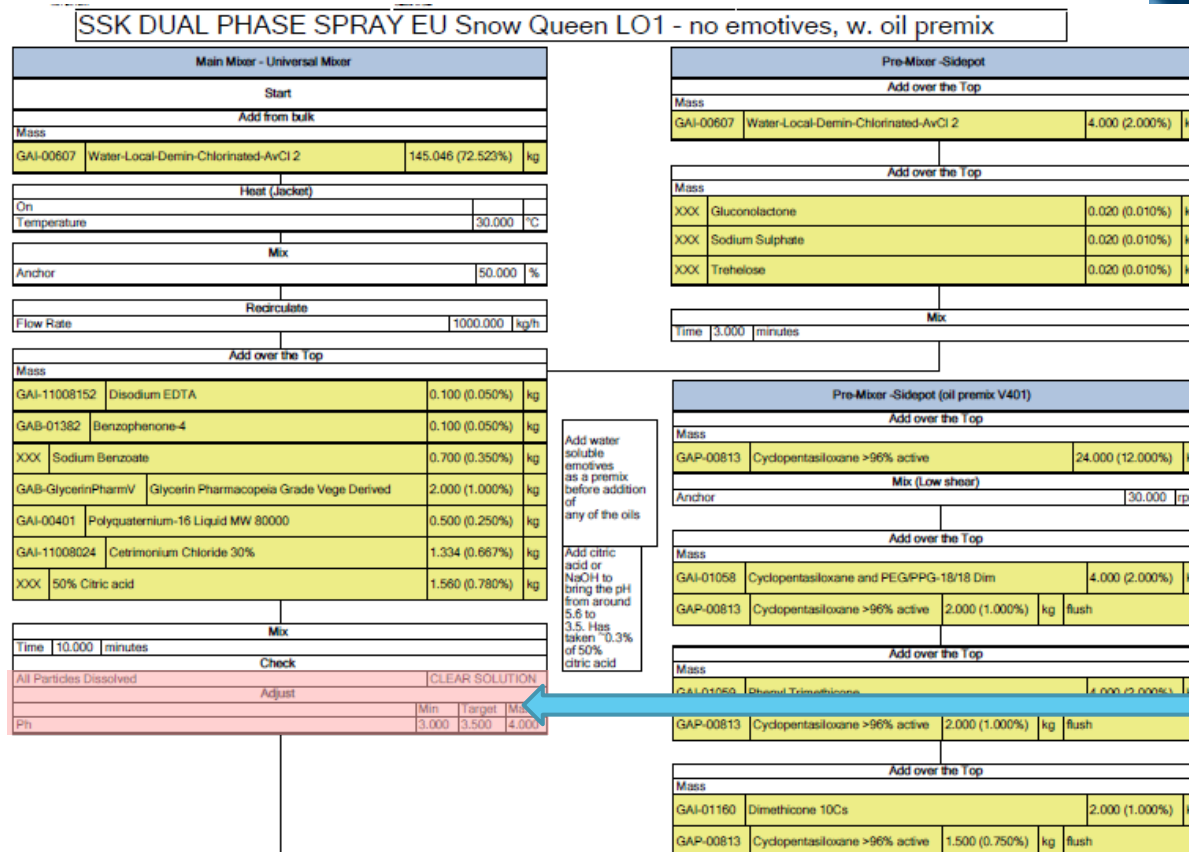
Process Specifications:
the **Process Flow Diagram (PFD)**

It defines in full detail all the process **parameters** required to deliver the product in specification...

... it accounts for the individual **equipment capabilities** and specifies **process conditions**.

This is essential for ensuring **product quality** and **process efficiency**

A process flow diagram



Mixers

Name & type
to use

Ingredients

What, how much,
when to add

Instructions

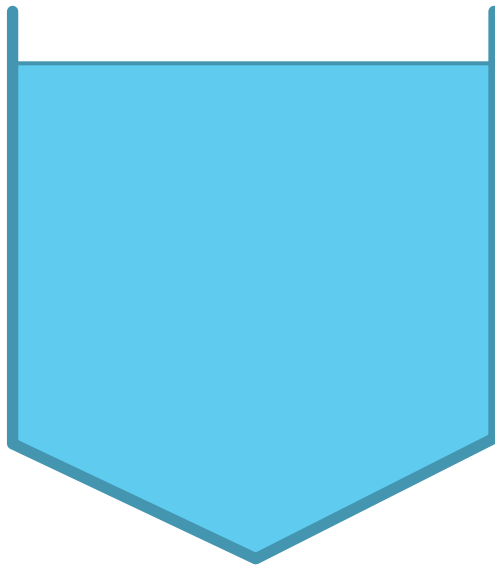
Time, temperature
Rate of addition...

CCPs: Critical control points:
Key to product
delivery

Liquid formulations in general can be made in two ways

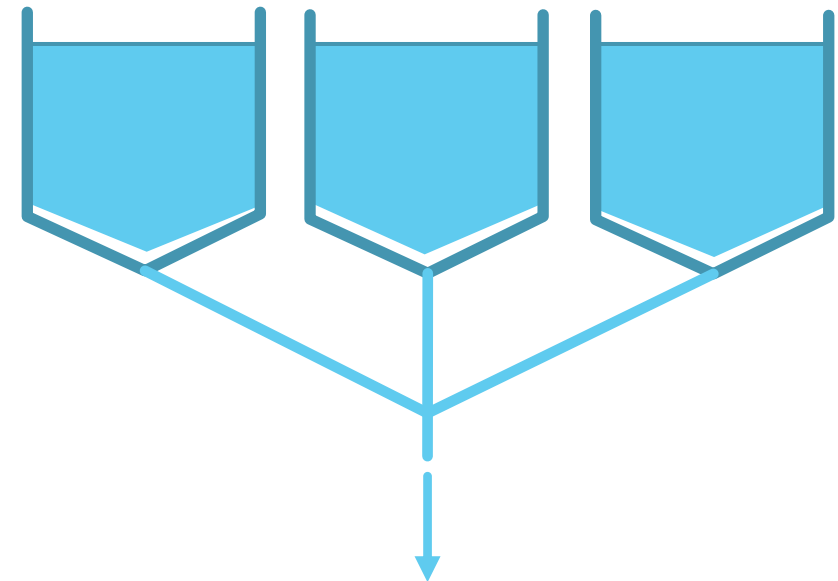
Batch Mode

The product is gradually constructed by sequential addition of materials (to a tank) over an extended time period:



Continuous Mode (Sonolation)

The product is constructed by continuously adding materials to a pipe over a short time period

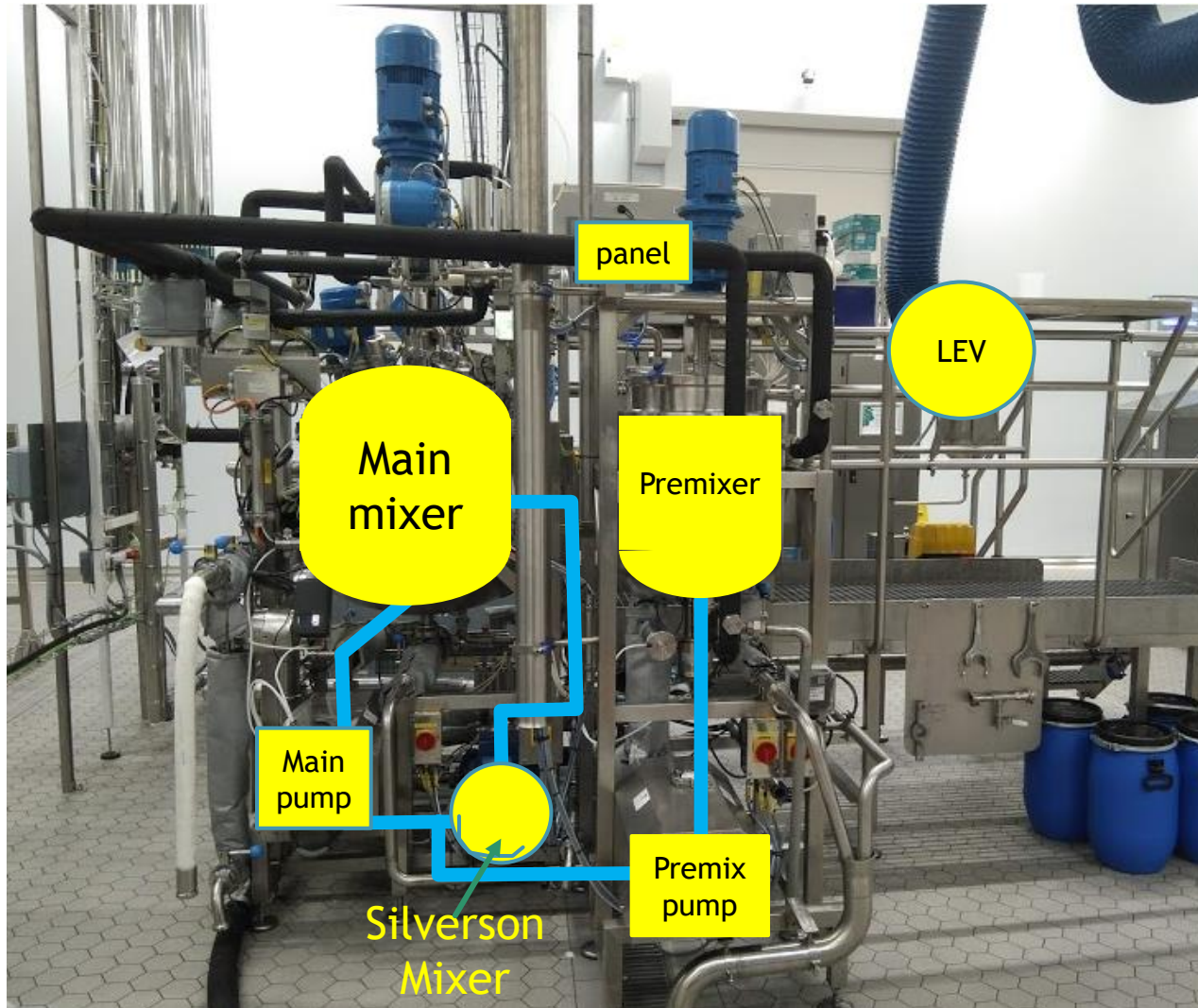




Detail and choice of process

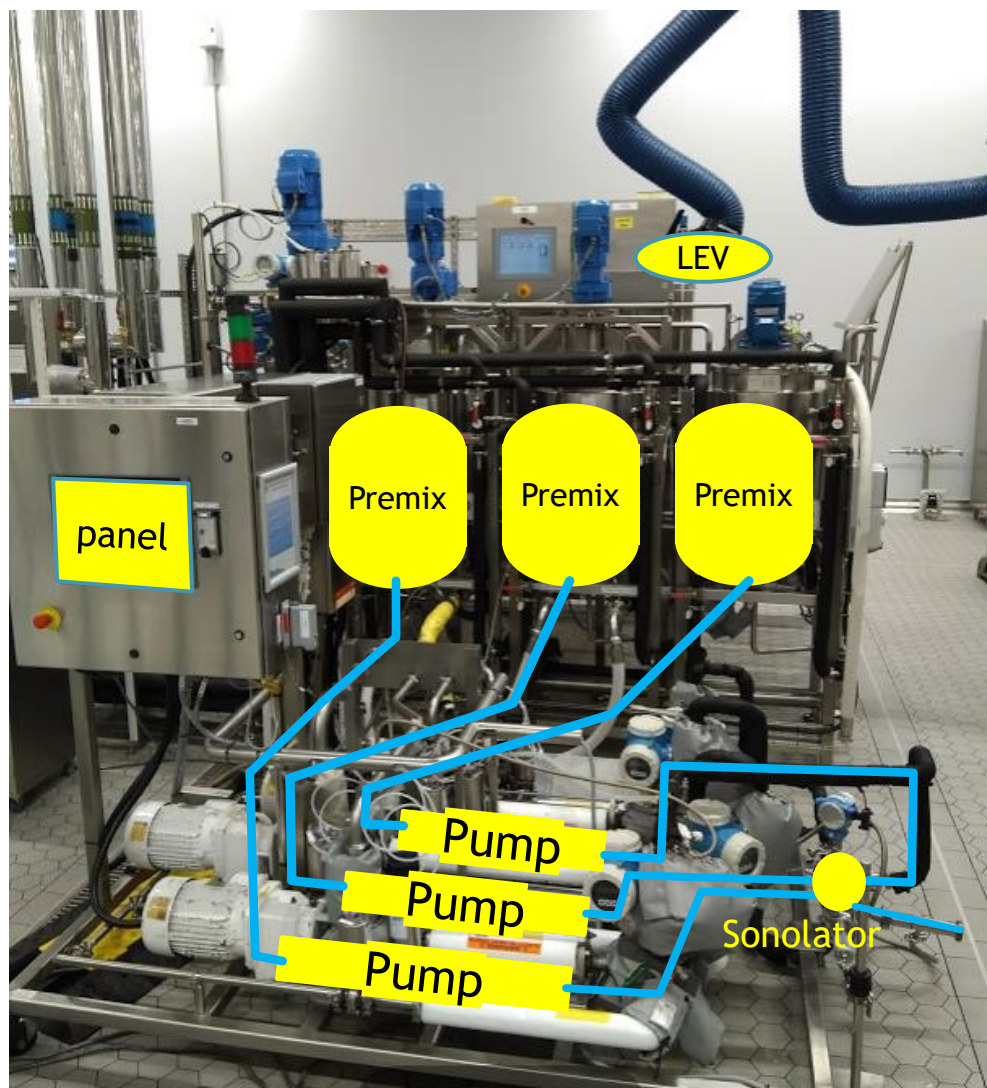
	Batch	Continuous (Sonolation)
Definition	<u>Sequential</u> addition of materials to gradually build compile the product	Manufacture in a pipe: <u>continuous</u> addition and mixing of materials
Complexity	Lower	Higher (& higher cost for control systems)
Process History Control	Lower (more statistical variation)	Higher (less statistical variation)
Throughput	Lower (2-5 T/hr)	Higher (20-30 T/hr)
Feasibility	Higher (many plants & 3Ps)	Lower (no plants & no 3Ps)
Suitability	Lower volume with short campaigns (MOQ 2-10 T)	Higher volume variants with larger campaigns (MOQ 20 T)

200L pilot plant (batch)



- Main mixer in which the product is constructed
- Main mixer pump to recirculate material
- High shear in-line mill (Silverson) for fine dispersion of materials
- Recirculation loop from mixer to Silverson & return
- Premixer for dissolving & slurring materials
- Premixer pump for injection to the recirculation loop
- Digitally enabled control panel for process control and monitoring
- Local exhaust ventilation for removal of dust

1 T/hr Pilot semi-continuous plant (Sonolation)



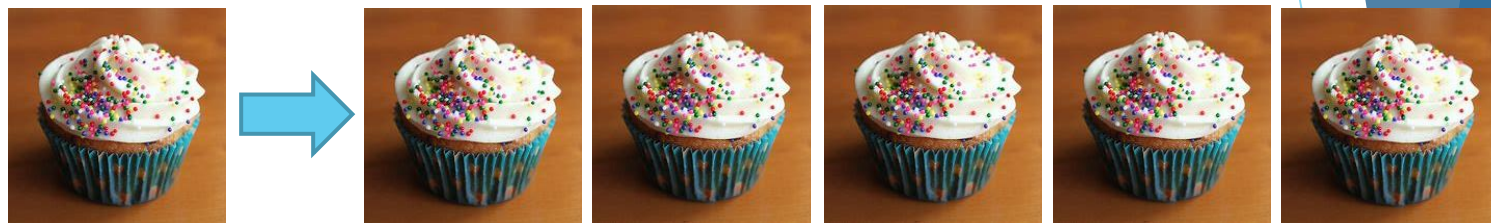
- Premixers for dissolving & slurring materials
- High pressure pumps supplying premixes to the Sonolator - capable of 20 Bar delivery
4 in standard design)
- Sonolator mixer and manifold to bring streams together ahead of the Sonolator
- Product outlet
- Digitally enabled control panel for process control and monitoring
- Local exhaust ventilation for removal of dust



SCALE UP CONSIDERATIONS

There are two ways to scale up an operation to make more material

- Do multiple operations at the same scale: **numerical** scale-up
- **higher** cost but no change in product properties



- Do a single operation at larger scale: **geometric** scale up
- **lower** cost but care has to be taken to reproduce product properties



- **We do geometric scale-up:** this means we aim for our pilot plant to be a smaller version of the factory - a proportional increase in the size of all dimensions:
- It is not straightforward because: Some parameters don't scale proportionally eg volume & surface area

Some parameters don't scale at all eg diffusion rates, atomic forces

Geometric considerations

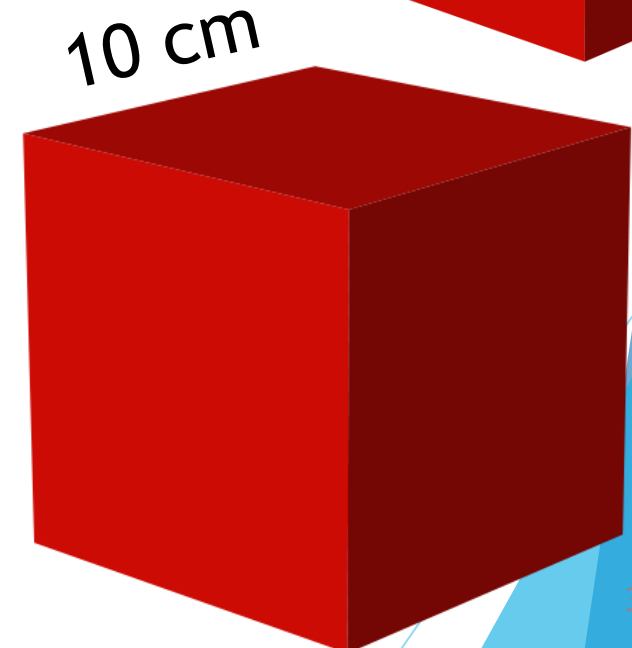
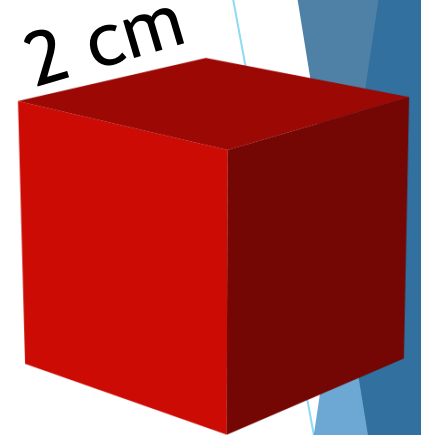
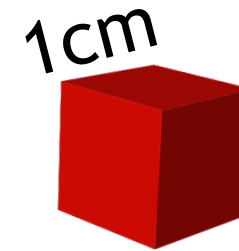
Imagine a mixer is a cube:

The volume to surface area ratio changes as we scale up....

Side length/cm	Volume/ cm ³	Surface Area /cm ²	V/SA ratio
1	1	6	0.17
2	8	24	0.33
10	1000	600	1.7

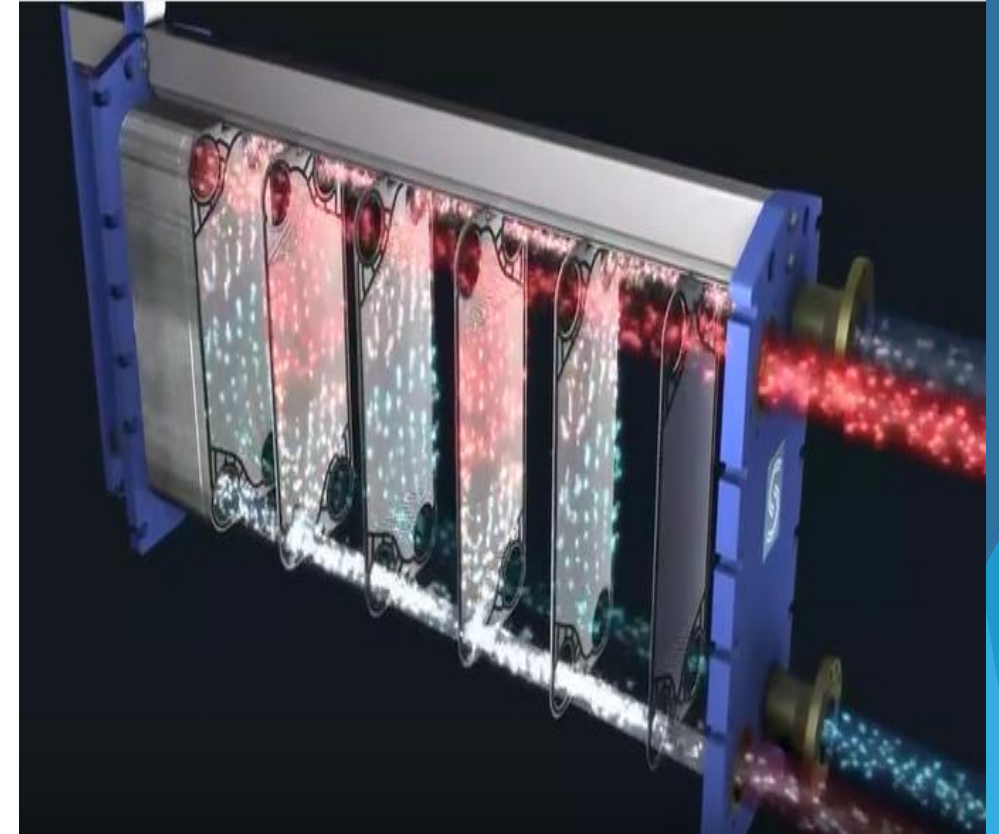
... because **surface area** scales with the **square of the dimension** but **volume** scales with the **cube of the dimension**

What is the consequence of this?



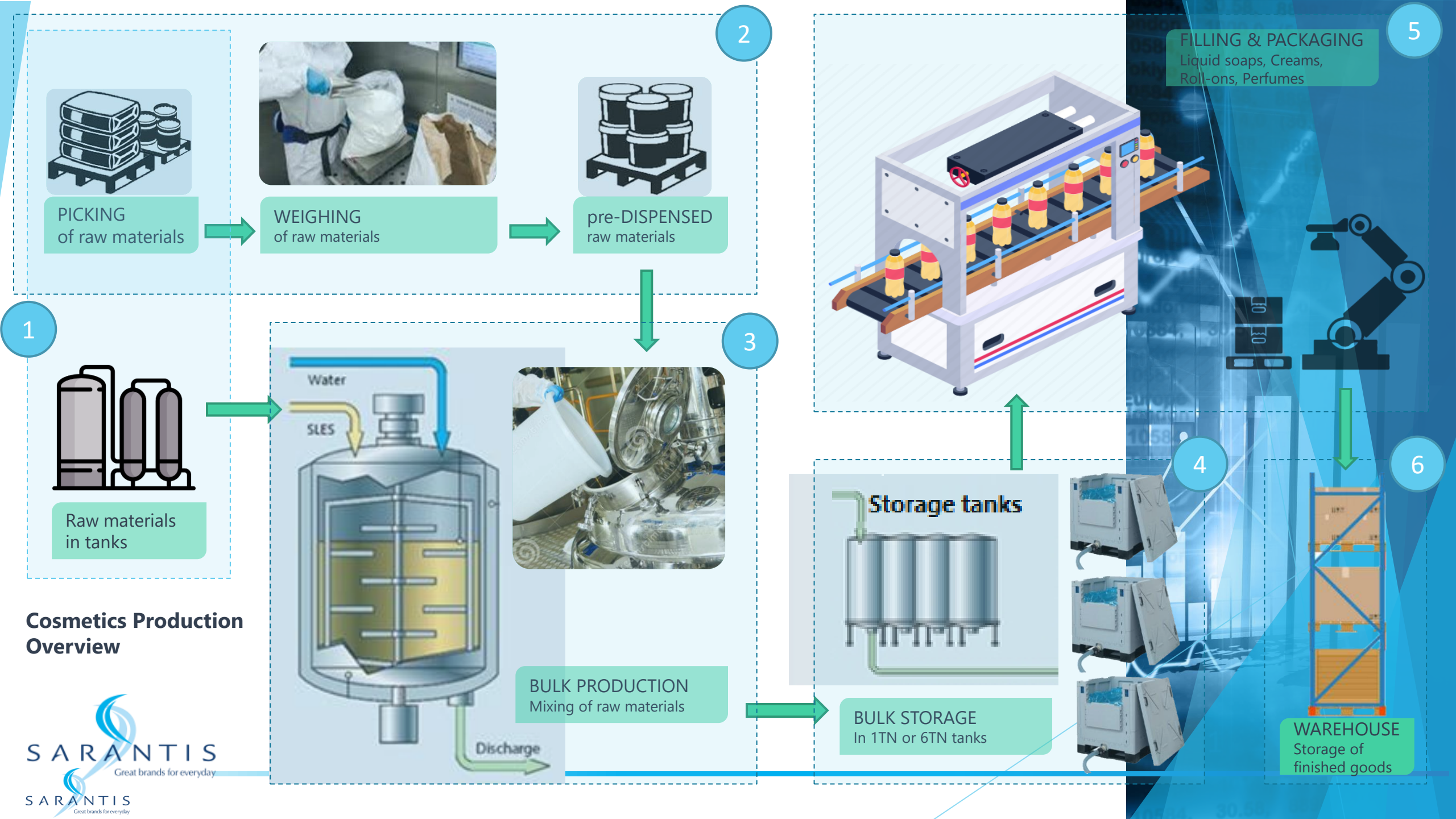
Heat transfer processes

- Processes often need to be **heated or cooled**: this can only **happen at surfaces**.
- Since **larger mixers** have **proportionally less surface area**: heat transfer will take longer ie heating or cooling to temperature
- This **additional time requires additional mixing** which may be undesirable (product quality or side reactions may be impacted)
- Increased cooling for liquids can be achieved with a plate heat exchanger.



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Cosmetics Production Overview



Next steps



BULK making



Packaging

Manufacturing Equipment - Perfumery Products



35 fixed vessels for perfume manufacturing

- Total Manufacturing Capacity: 1.700tn/yr
- Vessels Capacity: 400 L to 5000 L
- 50 portable 1m³ vessels for feeding bulk product to filling machines
- 2 Filtering skids (pump/heat exchanger/filter housing)

Equipment characteristics

- Stainless steel 316L
- Domed closed type
- Manhole
- Dispersing mixing (marine type impellers-low viscosity)
- Top input/ Bottom output
- GMP/Hygiene connections



Manufacturing Equipment - Bulk Liq. Soaps/Emulsions/Oils



13 mixing vessels (main & auxiliaries)

- Total Manufacturing Capacity: 18.000tn/yr
- Vessels Capacity: 100L to 6.000L
- 9 storage tanks for semi-finished of 6.000L

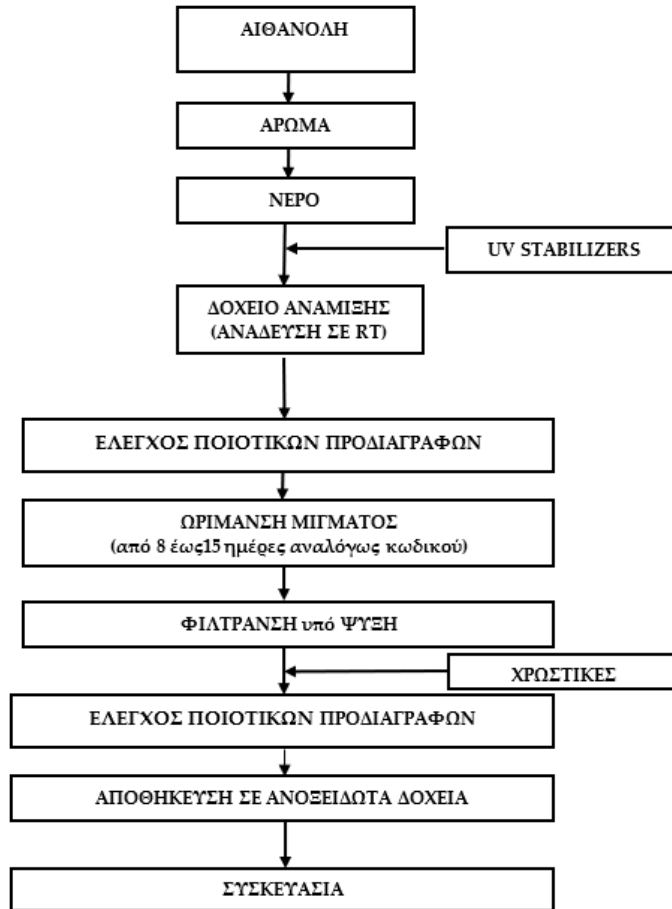
Equipment characteristics

- Stainless steel 316L
- Double wall jacketed
- Hydraulic operated domed lid or domed closed type
- Manhole
- Automatic Temperature control (heating/cooling)
- Load cells weighing system
- Pressure and vacuum capable
- Dispersing mixing (anchor/marine type impellers)
- Homogenizer (high speed)
- Wall scrapper
- Bottom/Top input/output
- GMP/Hygiene connections

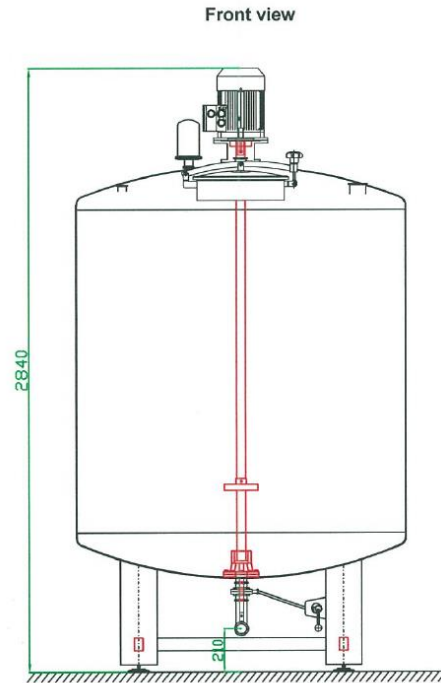


Perfumery Bulk Making

ΔΙΑΓΡΑΜΜΑ ΡΟΗΣ ΠΑΡΑΓΩΓΗΣ ΑΛΚΟΟΛΟΥΧΩΝ
ΠΡΟΪΟΝΤΩΝ (ΠΛΕΟΝ ΤΟΥ 60%)

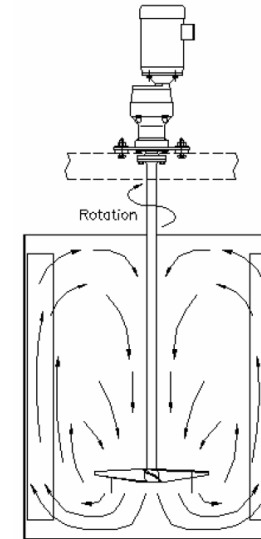


Δοχείο ανάμιξης αλκοολούχων



Προτιμώμενος τύπος ανάδευσης με
αξονική ροή για διαδικασίες ανάμιξης-
διάλυσης και δημιουργία **τυρβώδους ροής**

AXIAL FLOW



ΠΡΟΣΟΧΗ!!! Κύριος και βοηθητικός εξοπλισμός
προδιαγραφών ATEX. Η αιθανόλη είναι πτητική και
πρέπει να λαμβάνονται **μέτρα περιορισμού**
διαφυγής της για την αποφυγή δημιουργίας
εκρηκτικής ατμόσφαιρας

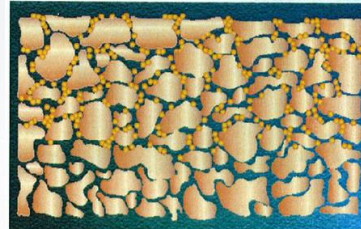
Perfumery Bulk Making

- Το στάδιο της **ωρίμανσης** του αρωματικού προϊόντος είναι απαραίτητο για το «**δέσιμο**» του **αρώματος - αλκοόλης και νερού**, τη **πιθανή δημιουργία ιζημάτων** και γενικότερα την εξασφάλιση της σταθερότητας του τελικού προϊόντος σε βάθος χρόνου οσφρητικά και εμφανισιακά μετά τη ψύξη και το φιλτράρισμα
- Η **φίλτραση υπό ψύξη** είναι απαραίτητη για να διασφαλίσει την άμεση αλλά και **μακροχρόνια διαύγεια** του τελικού προϊόντος. Η **ψύξη** σε θερμοκρασίες -7°C έως -4°C **βοηθά στην καθίζηση αδιάλυτων υλικών** όπως πχ ρητίνες και κεριά.
- Η φίλτραση πραγματοποιείται με χρήση **φίλτρων βάθους** καθώς επιτυγχάνεται καλύτερο αποτέλεσμα από την χρήση απλών φίλτρων επιφανείας.

Depth filtration



Surface filtration (Example : classic pleated filter)



Depth filtration (Example : SUPRACAP Pall)

▪ Limitations of surface filtration

- Particles retained by direct interception
- Small particles still go through the pores
- Passage of the elongated and deformable particles

Depth filtration

The depth filter can stop the particles on the surface and in the depth of the filter medium



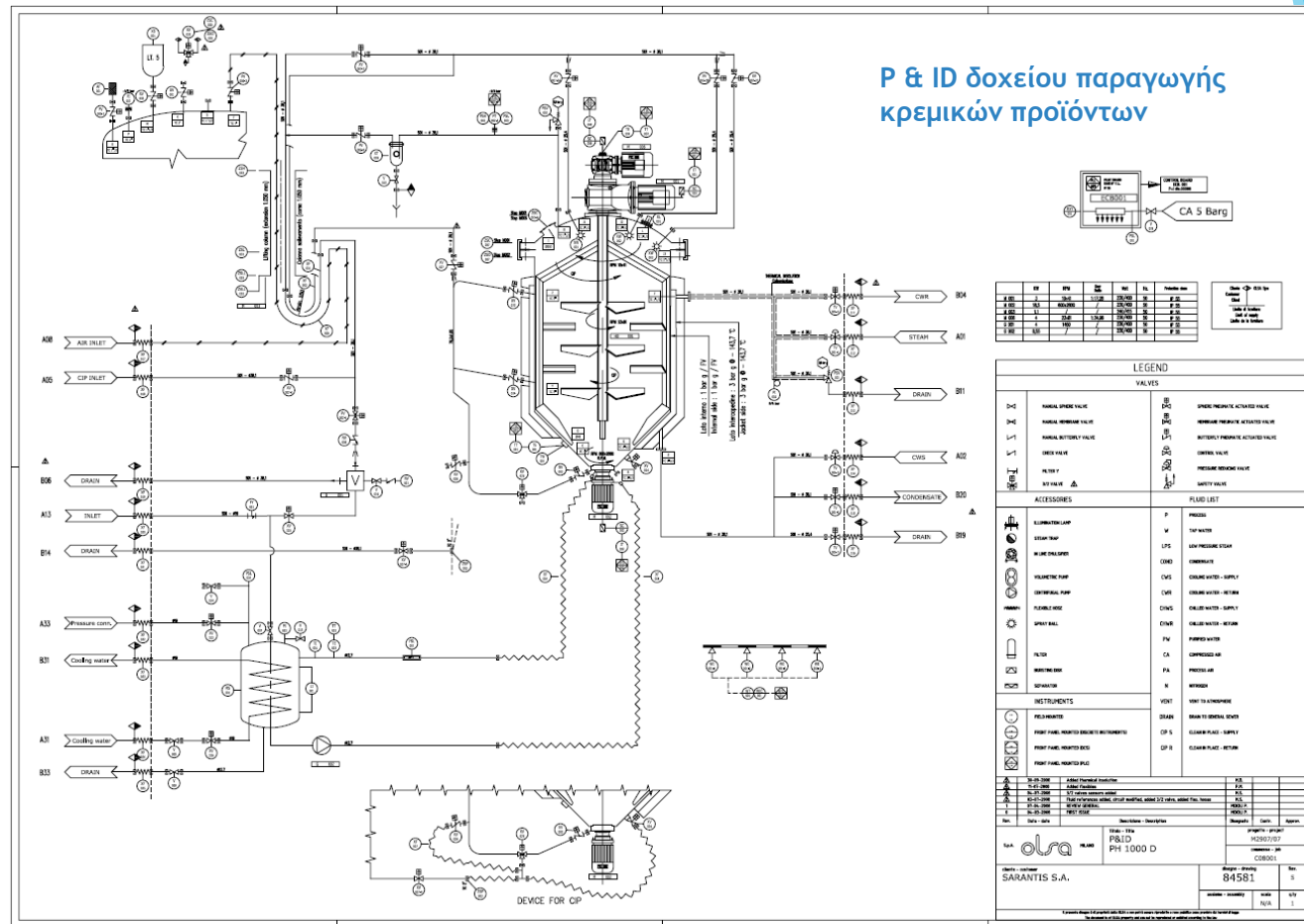
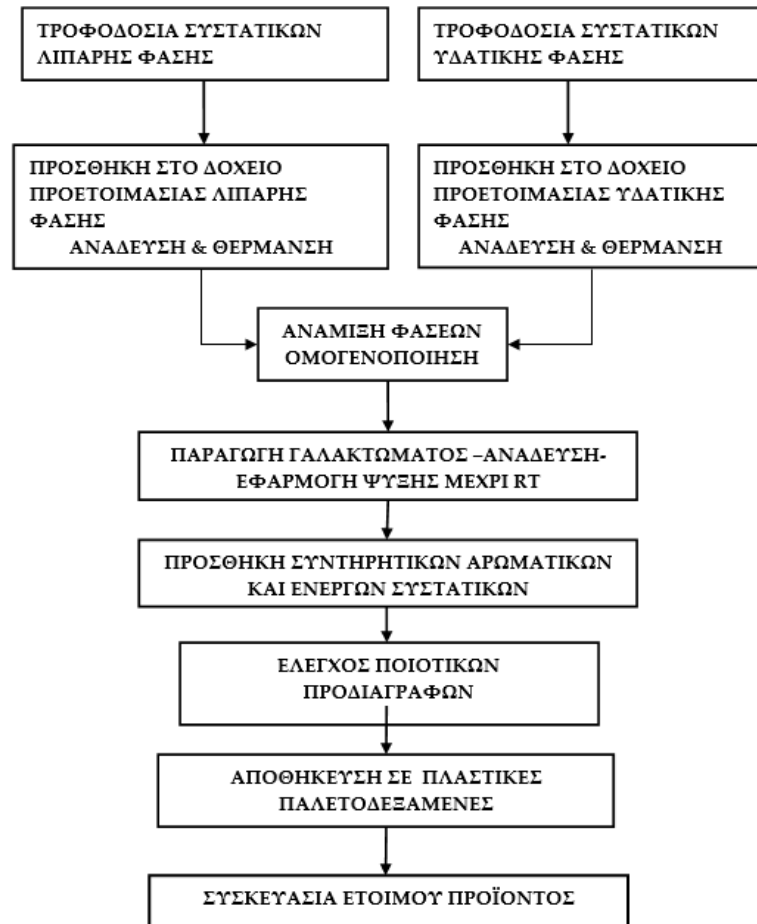
Increase of exchange surface

▪ Advantages of depth filtration

- Direct interception: formation of a layer of particles at the surface of the medium
- Interception by inertial impact : particles smaller than the pore size stopped because of their inertia
- Interception by attraction: particles retained by adsorption strengths

Emulsions Bulk Making

ΔΙΑΓΡΑΜΜΑ ΡΟΗΣ ΠΑΡΑΓΩΓΗΣ ΓΑΛΑΚΤΩΜΑΤΩΝ - ΚΡΕΜΩΝ



Emulsions Bulk Making

- Για την παραγωγή γαλακτωμάτων μεσαίου ή υψηλού ιξώδους χρησιμοποιούνται δοχεία με ανάδευση τύπου άγκυρας και χρήση scrappers από PTFE. Τα scrappers απομακρύνουν το προϊόν από τα τοιχώματα του δοχείου και έτσι επιτυγχάνεται καλύτερη ανάδευση/ομοιογένεια αλλά και αποδοτική μεταφορά θερμότητας.
- Η θέρμανση (ή η ψύξη) γίνεται μέσω χρήσης διπλότοιχου μανδύα στο κυρίως μέρος του δοχείου χρησιμοποιώντας το διαθέσιμο θερμαντικό ή ψυκτικό υγρό της εγκατάστασης (πχ ατμός και κρύο νερό στην περίπτωση μας
- «Καρδιά» του συστήματος είναι ο ομογενοποιητής, ο οποίος σε μια διάταξη ρότορα-στάτορα αναλαμβάνει να σπάσει 2 μη αναμίξιμες φάσεις (υδατική/ λιπαρή) σε μικρά σταγονίδια μεγέθους 2-5μm τα οποία με την βοήθεια του γαλακτωματοποιητή θα μπορέσουν σχηματίσουν ένα σταθερό γαλάκτωμα
- Τα δοχεία μπορούν να λειτουργήσουν σε κενό, απαραίτητο κατά την διάρκεια της ψύξης για την αποφυγή εγκλωβισμού αέρα στο προϊόν αλλά και για την εύκολη προσθήκη α' υλών



Αναδευτήρας τύπου άγκυρας με scraper



Στερεά σωματίδια ή σταγονίδια λιπαρής και υδατικής φάσης «εκσφενδονίζονται» με υψηλή ταχύτητα από τον ροτόρα προς τον στάτορα και διασπώνται σε μικρότερα σωματίδια, όπου μπορούν να ενωθούν σταθερά μέσω του γαλακτωματοποιητή



Next steps



BULK making



Packaging
COSMETICS

Manufacturing Equipment -9 Packaging Lines

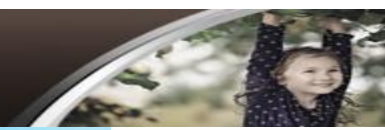


Line	Type of Products	Capacity (mio pcs/yr)
1	Perfumery	11,0
2	Perfumery, lotions, sun care	6,3
3	Rinse-off, milks, lotions	18,5
4	Rinse-off, milks, lotions	11,0
5	Perfumery & DEOs	8,3
6	Doypacks	8,3
7	Tubes	17,7
8	Hot filling products	4,0
9	Jars	6,0

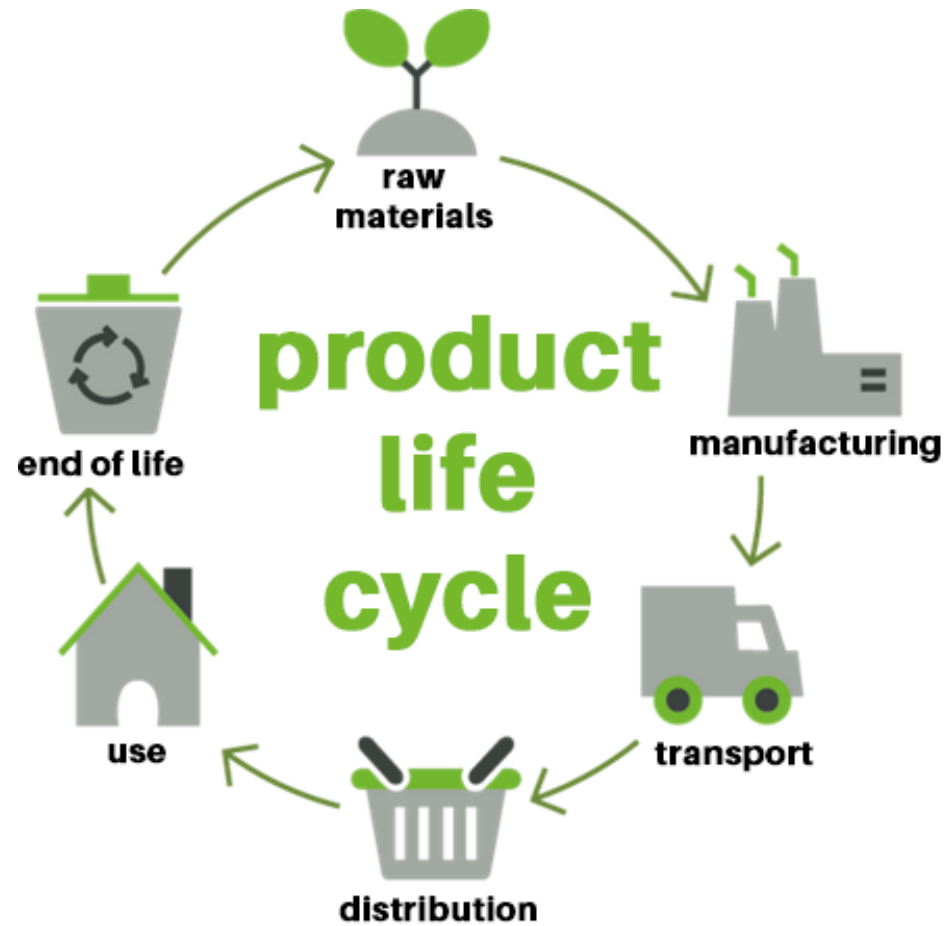


1. Company Intro
2. NPD/EPD Process
3. Processing
4. Production
- 5. Sustainable design**

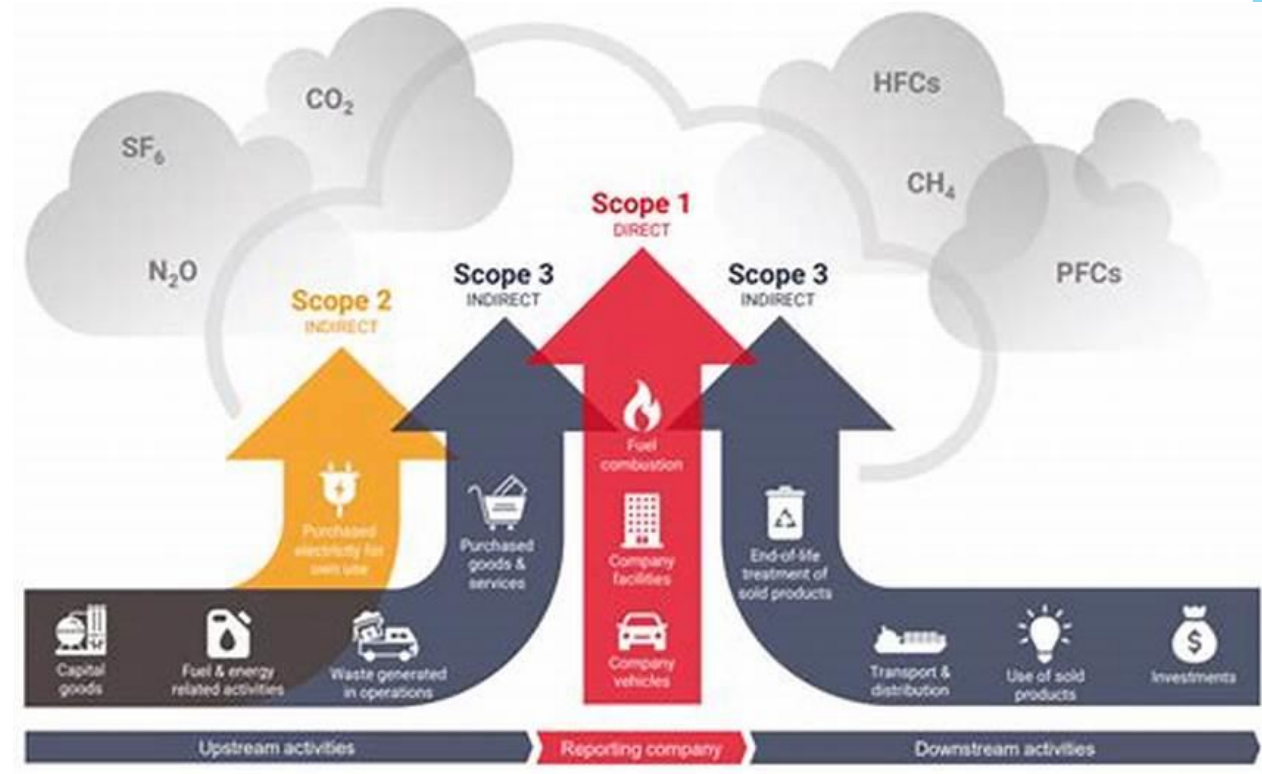
Design levers for 'sustainable'



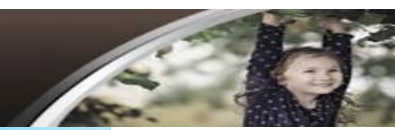
Lifecycle Assessment (Holistic)



Scopes 1-3



Design levers for 'sustainable'



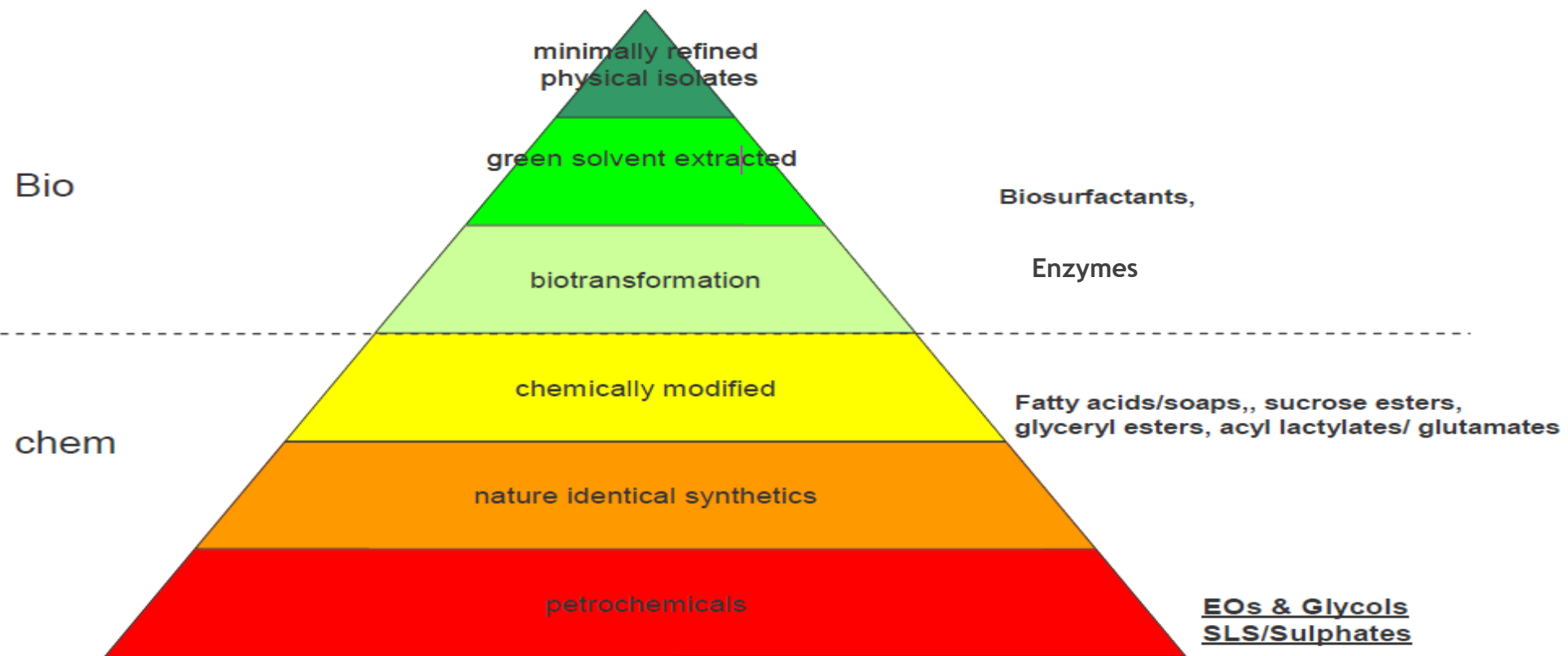
Weight efficient sustainable raw materials

Better, less, no packaging

Product compaction

Habit disruptive Formats

Sustainable RMs



Sustainable Raw Materials



Tuticorin Alkali Chemicals

Coal CO₂ ->
Solvent capture (MEA) ->
+Salt and ammonia->

Sodium Carbonate



India Glycols Limited

Industrial CO₂ + microbes
Ethanol ->
Ethylene oxide->

Non Ionics



Industrial CO₂ + microbes
Polyethylene



Sustainable RMs- Claim



SUSTAINABLE



Safer the Planet

Biobased, Organic, etc.

**FUNCTIONAL
BENEFIT
&
SUSTAINABLE**



**Safer the Planet &
better performance**

Deeper/ LL Cleaning, foaming, etc.

**EMOTIONAL BENEFIT
&
FUNCTIONAL
BENEFIT
&
SUSTAINABLE**



Safer for ME & MY Planet

Hypoallergenic, 'FREE FROM'

Packaging

RECYCLABLE PLASTIC

Single type across components

		
PETE	HDPE	PVC
Polyethylene Terephthalate	High-Density Polyethylene	Polyvinyl Chloride

BETTER PLASTIC

PCR usage
PCR provenance- ocean



LESS PLASTIC

Drive Concentration
Design material efficiency
Refills

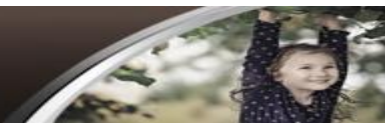


NO PLASTIC

Discover alternate materials & formats
Explore alternate business models



Packaging- Better



PCR



BIOBASED



Braskem

Packaging- Better



PLASTIX



PACKAGING- Less



PACKAGING- Less (Compaction)

Formulation and pack compaction in tandem

HOW CAN LESS BE MORE?



65gr



32gr



3.5gr



50ml



30ml



25ml



10ml



PACKAGING- Less (Compaction)

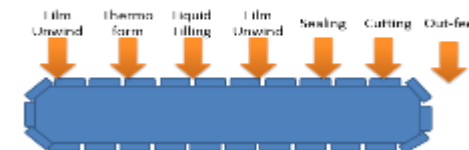


Compaction- Unit dose

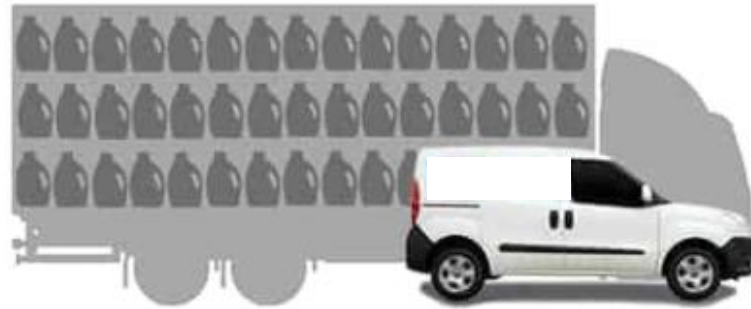
Customization



Standard Linear Process



Compaction- Unit dose



Holistic Compaction- Refills



Disrupting consumer habits



ASDA

TESCO



Disrupting consumer habits



LOW TEMP WASH



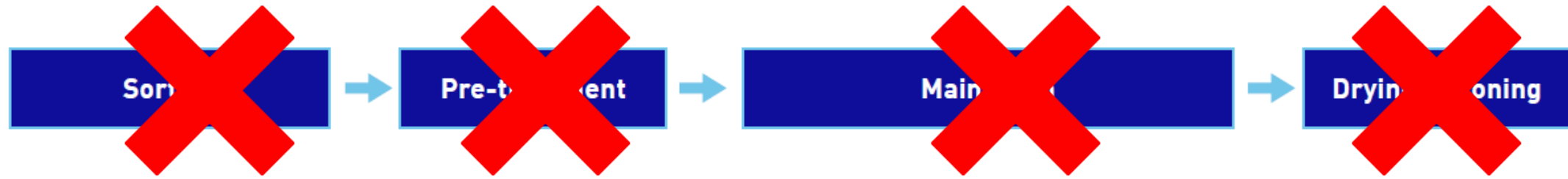
QUICK WASH



EASY RINSE



Disrupting consumer habits



STEP 1
LAY OUT



STEP 2
SPRAY



STEP 3
SMOOTH OUT



STEP 4
HANG



STEP 5
READY TO GO



Thank you

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