

**BUILDING AN ACTIVE GLOBAL COMMUNITY  
FOR A DIGITAL-FIRST APPROACH  
TO INNOVATION AND SUSTAINABILITY**



**EWAN COOK**  
Process Development Engineer



Unilever



Unilever

**“One of the world’s largest consumer goods companies with a portfolio of leading purposeful brands, an unrivalled presence in future growth markets, and a determinedly commercial focus as a sustainable business.”**

**3.4B**

people use our products every day

Available in over

**190**

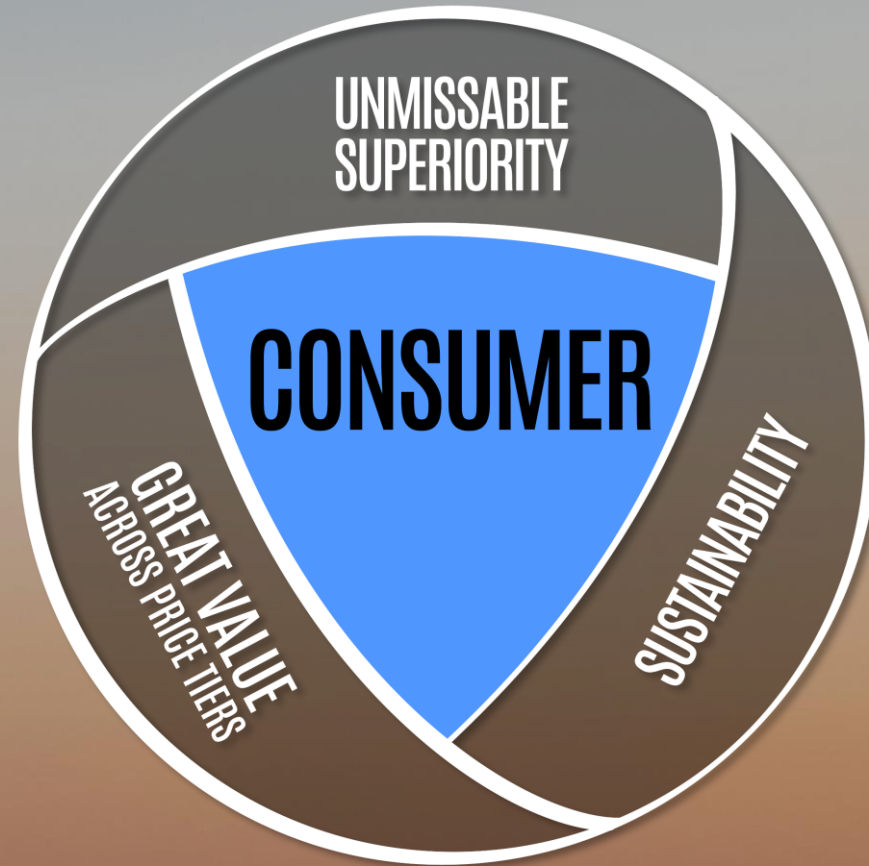
countries

**€60.1B**

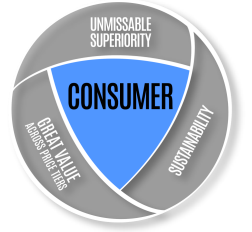
turnover in 2022



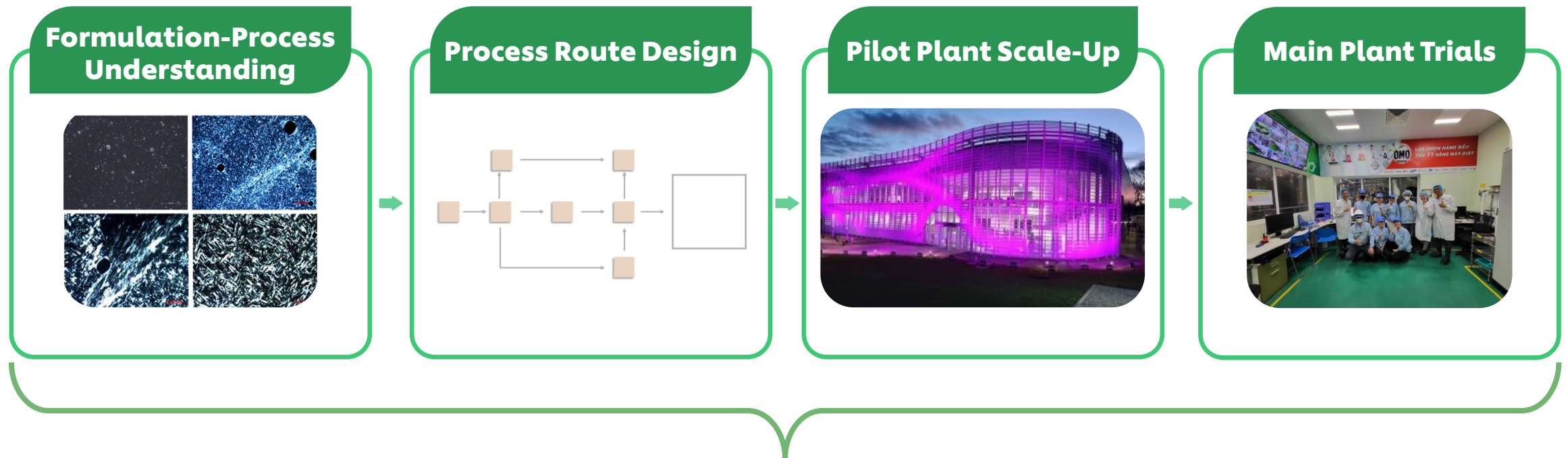
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# Home Care Process Development



## “Delivering our Clean Future strategy to factory-scale”



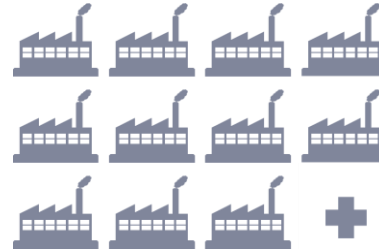
**Ambition: Digital-Driven Innovation!**

# Piloting a hypothesis-driven approach to DOE

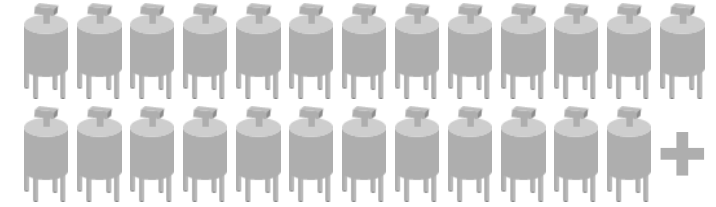
## New Formulation



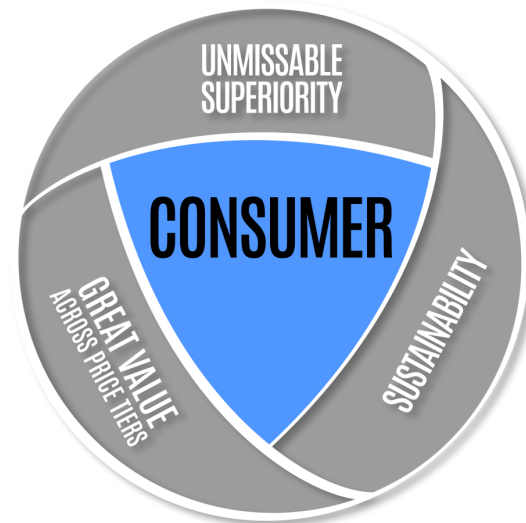
## 11+ Factories



## 25+ Mixers

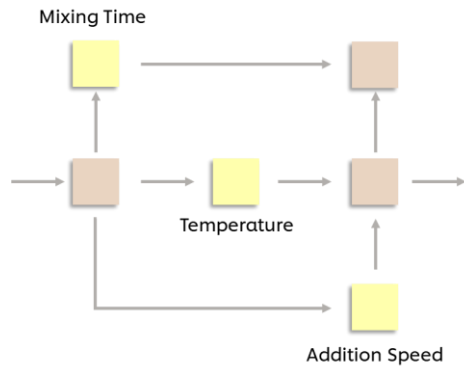


## Global rollout: How can we optimise the process?



# Piloting a hypothesis-driven approach to DOE

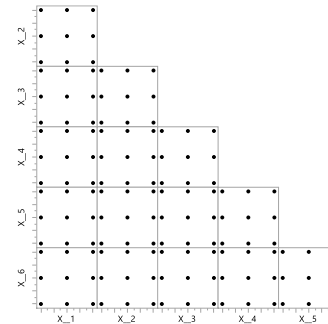
## Hypothesis



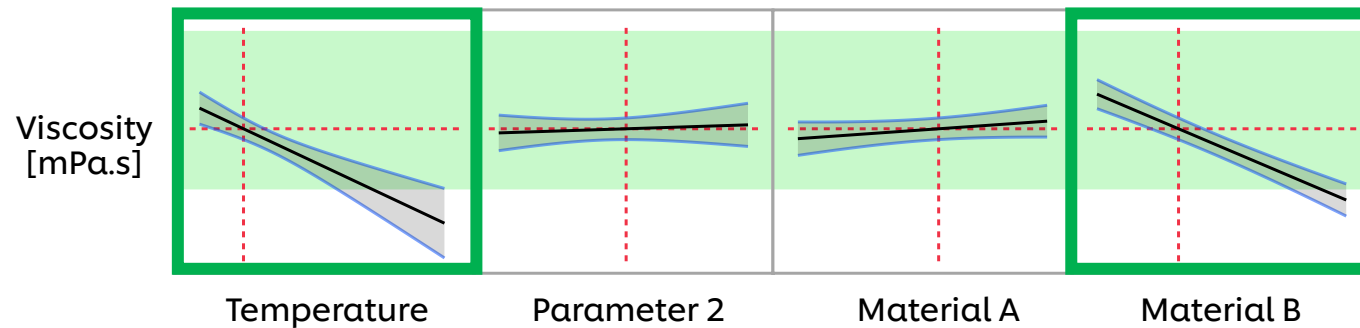
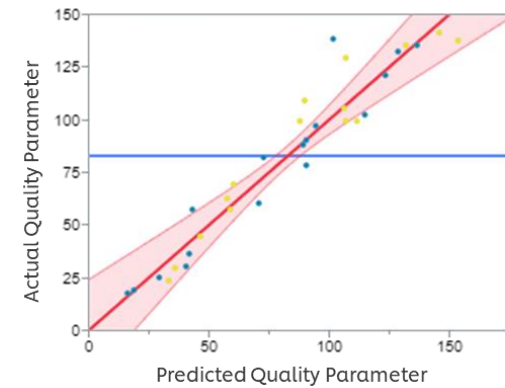
## Design of Experiments



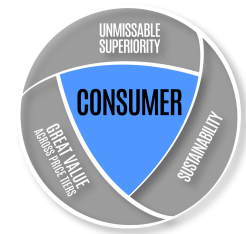
Pilot Scale < 50L



## Identify CCPs



**Double-digit €Ms in material savings**  
**Sustainability through energy reduction**



Building an active global community: key skills for every engineer

## **Global Community of Practice**



# Building an active global community: key skills for every engineer

## Global Community of Practice

**20%**

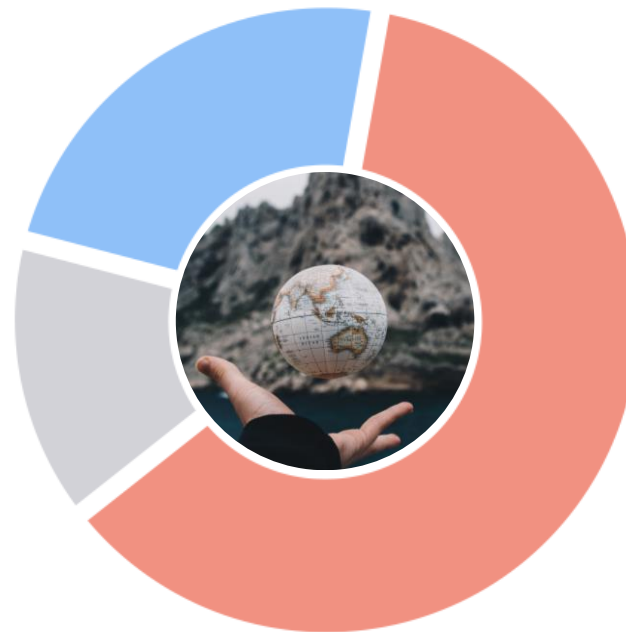
### Shared Learnings

through regular sessions with all participants and mentors

**10%**

### Structured Training

led by JMP champions working within Home Care Process Development



**70%**

### Delivering Impact

through key technologies in high-value projects



# Building an active global community: digital-first approach

**HYPOTHESIS**  
**JMP + DOE**  
**EXPLORE**

Structured data capture and DOE-driven exploration



Build data analysis and modelling skills to develop insights



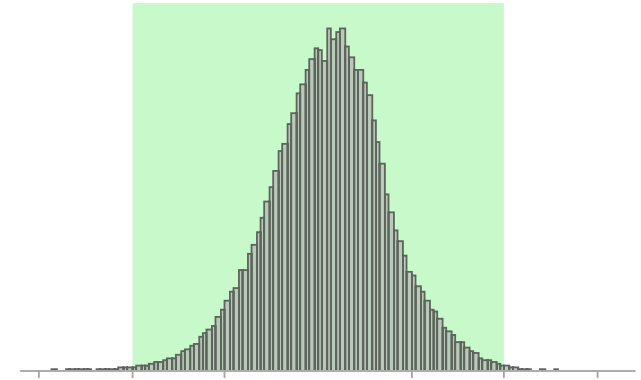
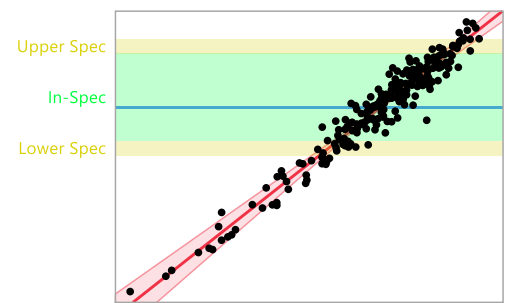
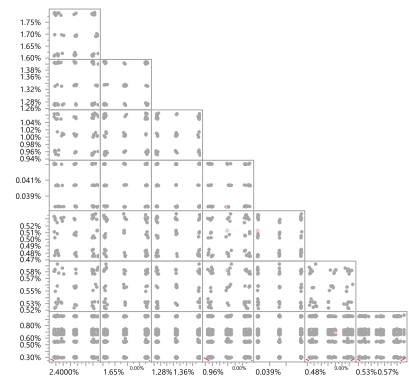
**Ambition**  
Experts at creating value-adding technology insights

**'Custom Design'**  
typically using a response surface

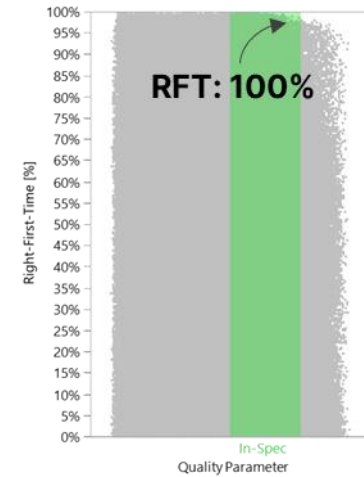
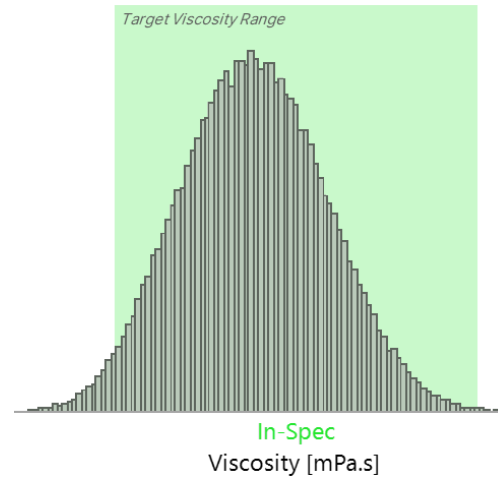
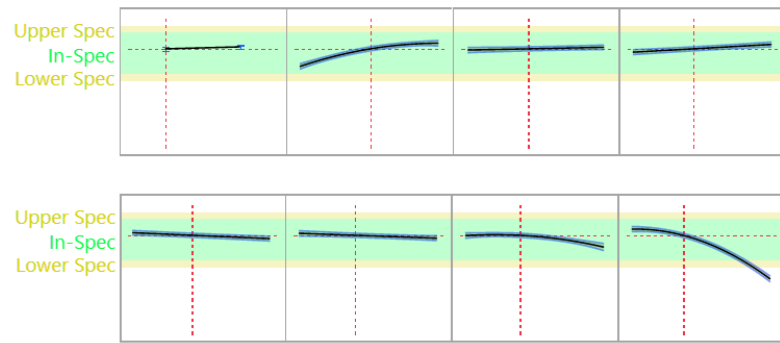
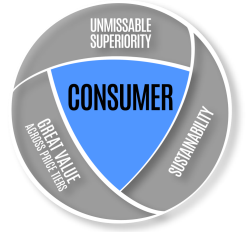
**'Standard Least Squares'**  
and Stepwise fitting, with a focus on no multicollinearity

**'Simulation'** + **'Desirability'**  
with the use of 'logistic' approaches and more complex profiling

Run	Rate	Variety	Field	De-Steem	Yeast	Temperature	Pres	Barrel Age	Barrel Seasoning	Filtering
1	1	Dijon	3	No	Wild	High	Soft	New	Kin	Yes
2	2	Bernard	4	Yes	Cultured	Low	Hard	New	Kin	No
3	3	Bernard	2	Yes	Wild	High	Hard	New	Air	No
4	4	Bernard	1	Yes	Wild	Low	Hard	2 Years	Air	Yes
5	5	Dijon	2	Yes	Cultured	Low	Soft	New	Kin	No
6	1	Dijon	2	Yes	Cultured	Low	Soft	2 Years	Air	Yes
7	2	Dijon	1	No	Cultured	High	Hard	New	Air	No
8	3	Dijon	4	No	Cultured	High	Soft	New	Air	Yes
9	4	Dijon	4	Yes	Wild	High	Hard	New	Kin	Yes
10	5	Bernard	2	No	Wild	Low	Hard	New	Air	Yes
11	1	Bernard	3	Yes	Wild	High	Hard	New	Air	No
12	2	Dijon	1	Yes	Wild	High	Soft	2 Years	Air	Yes
13	3	Bernard	4	Yes	Wild	Low	Soft	2 Years	Kin	No
14	4	Bernard	3	No	Cultured	Low	Soft	New	Air	No
15	5	Dijon	2	No	Cultured	High	Soft	2 Years	Kin	No
16	1	Dijon	1	No	Cultured	Low	Hard	2 Years	Kin	Yes
17	2	Bernard	2	No	Cultured	Low	Hard	2 Years	Air	No
18	3	Dijon	2	Yes	Cultured	High	Hard	New	Kin	Yes
19	4	Bernard	1	No	Cultured	Low	Hard	New	Kin	Yes
20	5	Bernard	3	Yes	Cultured	High	Hard	2 Years	Air	Yes
21	1	Bernard	4	No	Wild	High	Hard	2 Years	Kin	No
22	2	Bernard	4	Yes	Cultured	High	Soft	2 Years	Kin	Yes
23	3	Dijon	1	No	Wild	Low	Hard	2 Years	Air	No
24	4	Dijon	2	Yes	Wild	High	Soft	2 Years	Air	No
25	5	Bernard	1	No	Cultured	High	Soft	New	Kin	No
26	1	Bernard	2	No	Wild	Low	Soft	New	Kin	Yes
27	2	Dijon	3	No	Wild	High	Hard	New	Kin	Yes
28	3	Bernard	1	No	Wild	High	Soft	2 Years	Air	Yes
29	4	Bernard	3	Yes	Cultured	High	Soft	2 Years	Kin	No
30	5	Dijon	3	Yes	Wild	Low	Hard	2 Years	Kin	No
31	1	Dijon	4	No	Cultured	Low	Hard	2 Years	Air	No
32	2	Bernard	2	Yes	Wild	Low	Soft	New	Kin	Yes
33	3	Bernard	3	No	Cultured	Low	Soft	New	Kin	Yes
34	4	Dijon	2	No	Cultured	High	Hard	2 Years	Kin	Yes
35	5	Dijon	4	Yes	Cultured	Low	Soft	New	Air	Yes
36	1	Bernard	1	Yes	Cultured	High	Soft	New	Air	No
37	2	Dijon	3	No	Wild	Low	Soft	2 Years	Air	No
38	3	Dijon	3	Yes	Cultured	Low	Hard	New	Air	No
39	4	Dijon	4	No	Wild	Low	Soft	New	Air	No
40	5	Bernard	4	No	Wild	High	Hard	2 Years	Air	Yes



# Case Study 1 – Product Superiority



## Characterisation

Modelling the formulation space built in-depth formulation understanding and led to an optimised product

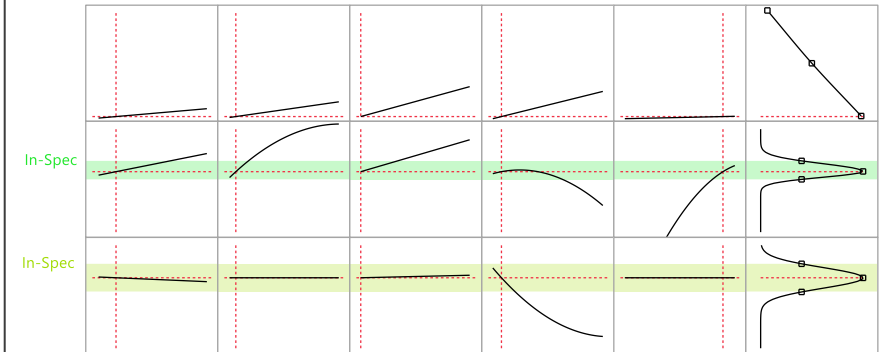
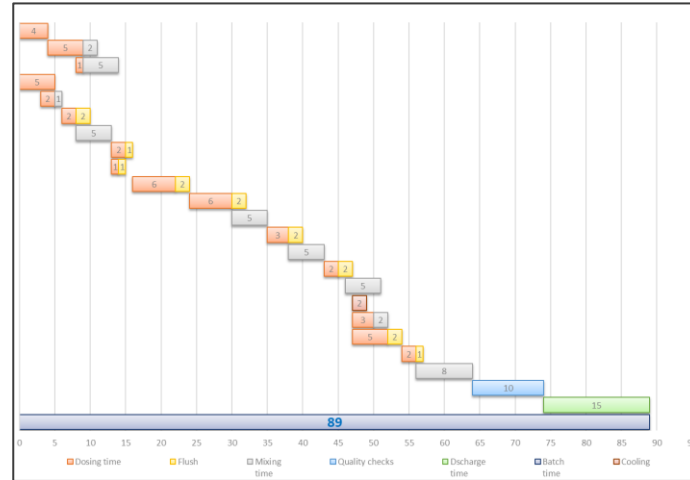
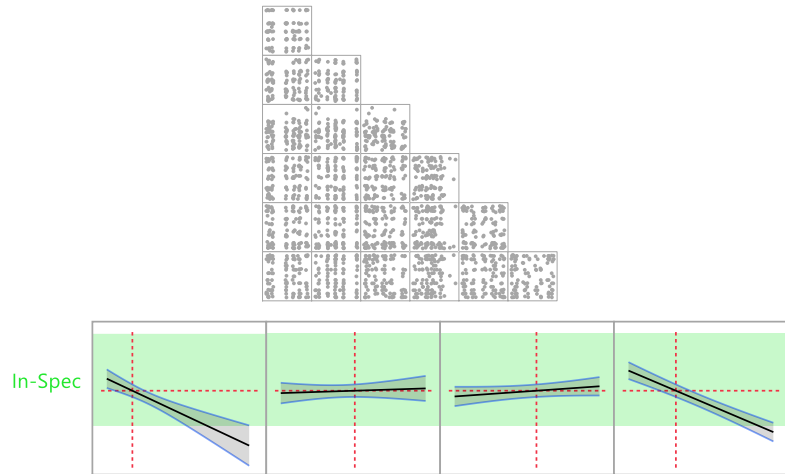
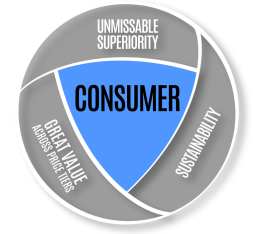
## Robust at Factory

Simulating formulation behaviour at our factories enabled multi-million euros in CAPEX avoidance

## De-risked Early

This approach built confidence in the right-first-time factory scale-up of high-performing, great-value products

# Case Study 2 – Value and Sustainability



## Characterisation

Exploring product and process behaviour led to new technical insights and deeper chassis understanding

## -26% Batch Time

Optimising the factory process unlocked batch cycle time savings, increasing factory make capacity

## -21% Polymer

Profiling enabled us to maintain performance, reduce cost, and improve product sustainability

# Key Learnings

1

## **Focus on high-value projects**

helped us to create real business impact and bring stakeholders on board with a digital-first approach to innovation

2

## **Frequent presentations**

by teams maintained the cadence of development, value creation, and the transfer of understanding to cross-functional teams

3

## **1:1 Mentoring**

was an invaluable investment of resource in the early stages of our journey

4

## **Long-term commitment is key**

to successfully change ways of working



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HOME CARE

