

Unit dose → Fulfilling consumer Aspirations

Balakumar Ramakrishnan

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Regional Marketing Manager – India & Africa (Novozymes South Asia Pvt Ltd)



The Structure for today.....

1. The shift to unit dose in developed markets......

2. Consumer underpinnings.....

3. Performance & Formulation guidelines.....



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driven by the liquid and Unit Dose category



Euromonitor Home Care from trade sources/national statistics, AUG 2017



Global market size development in value of laundry

Takeaways

- Strong growth can be observed in Unit Dose until 2016, when growth tappers off. In 2021 it will have gained 8% market share among categories
- The liquid category shows moderate growth around 3% CAGR and is likely to replace powder as the dominating category in the mid-2020s
- The powder category shows moderate growth from 0-1% CAGR due to higher adoption of liquid and Unit Dose

- In volume terms, Unit Dose has only 2% market share, indicating lower dosages and higher prices for this category
- Powder volumes are steady to increasing, but prices appear to erode slowly
- Liquid appears to be stable in prices on an aggregated level



Tonnes mil., CAGR 🛑 Unit Dose 🔶 L

Liquid 🛛 Powder

Liquids & Powder Detergents still hold major market share across regions. But Unit dose is showing good growth in developed markets



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As markets mature, there is a growing consumer preference for 'liquid-like' benefits, driving liquid growth as well as impacting powder positioning





Liquid							
Powder							
-							



Functional

- Stain Removal
- Whiteness
- Sensory experience
- Hygiene
- Low water performance
- Hygiene performance credibility

Shift in Powder claims in Key Markets**



Over the past 10 years in Powders, there is a clear increase in liquid like claims of **Ease and Speed of use**, **pH Neutral , Fabric Care etc.**

Caring + Convenience

- Care for fabric & colours
- Caring for people & environment
- Specialized for sorted fabrics
- Faster and better pre-soaking
- Less rinsing required
- No powder residues



* Representative development, not to any scale

Unit dose has captured significant market shares in European countries



Detergent Sales Value, EURm

Source: Nielsen (2017) and Stamminger et al (2017). Percentages are total sales of the format relative to all other formats

Unit Dose getting lot of shelf space





Source: Carrefour, Lille France, August 2017

Format of the unit doses

Hen "V-Pe	kel		Unilever	Ariel 3in1		
Liquid "Liquid- Only V-pod"	Hybrid "Hybrid V-pod"	One chamber "one-chamber"	Hybrid "Hybrid Rubber Boat"	3 chambers "Powercap"	Green "Ariel : 3in 1"	Purple "non-Ariel:3 in 1"
9 pods	4 pods	5 pods	4 pods	1 pod	8 pods	4 pods
		1	Private label			
	One chamber "one-chamber"	2 chambers <i>"Wave-pod"</i>	2 chambers <i>"L-pod"</i>	2 chambers "Bubble v-pod"	Hybrid "split V-pod"	
	8 pods	10 pods (most by McBride)	1 pod (RB)	2 pods (Persán)	1 pod (Tesco Poland)	- 5



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Convenience driving the tradeup to Unit Dose



Convenience drive pod users

Eric (US) has used Pods instead of liquid detergent since coming to university. It is inconvenient to carry around the large containers in which liquid detergent is usually stored. To him, it is all about convenience and making the laundry process less cumbersome

Kathleen (US) does not like powder detergents. They are not easy to carry, the packaging is hard to close (again) and the risk of spilling detergent is high Moritz (DE) currently uses powder, but considers switching to Pods as dosing is a hassle: "*Then I don't need to think about dosing, I just throw it all in and that's it*". However, he believes Pods are currently overpriced

Kelly (US) loves the handiness of Pods; "*It's easy, not messy, doesn't spill.*" *It simply required less attention*"

However, performance-wise, she does not observe a difference between Pods and regular liquid detergent. Further, Pods are not well-suited for her front-loader*

ebay

For college students, <u>Tide Pods</u> are ideal since they are easy to store in compact places, are lightweight for transporting, and take the guesswork out of measuring the right amount of detergent. Tossing just one in the washing machine removes dirt, stains, and odors.

In Summary, the students liked the Tide PODS for four main reasons:

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-Portability -Easy to use -Time efficient -Universal to all types of laundry loads.

12 Source: Novozymes ReD study, 2016

* See speaker's notes

Source: Slideshare

Still some issues: Pods not dissolving!



Laundry Pods Not Dissolving? 6 Steps on How to Use Laundry Pods



refreshingly SIMPLE

Still some issues: Exposure of laundry detergent

KEEP LIQUID LAUNDRY PACKETS UP AND AWAY FROM CHILDREN.

WHAT YOU DO MAITERS.

Days get hectic and schedules are full. Children act fast and accidents can happen.

One small step can help keep your family safe.

American Cleaning Institute® | cleaninginstitute.org | 202-662-2507





P&G brings Child-Guard lids to Tide PODS..





Tide Pods: TVC's when launched – Save money per load and Maximize your loads of laundry (less overdosing)

"The True Cost of Your Laundry Load Tide Pods Laundry Detergent"



"Maximize Your Loads of Laundry Tide Pods Laundry Detergent"





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Counting Pods

Overall U.S. detergent sales have fallen as capsules replace liquid and powdered products. Now, P&G is telling consumers to use up to three Pods for extra large loads.



Note: Pricing based on products sold by Target.com

Source: The Wall Street Journal, June 8, 2016 (based on Nielsen sales data).

THE WALL STREET JOURNAL.



Pacs Dosing Instructions



Dosage recommendation has changed for Tide Pods ..

1 Pac for Medium 2 Pa Loads

cs for Large 3 Pa Loads Lai

3 Pacs for Extra Large Loads

Keep out of reach of children.



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Pods have different formats



There is a difference in performance between one and two chamber pods – also on enzyme sensitive stains

Two chamber one chamber







- The average performance of liquid pods of two champers is higher than the once with only one chamber.
- Addition of enzymes can increase the level of performance, even if one-chamber.
- Difference in format not seen on cost/wash, but maybe production cost.



Characteristics of liquid unit doses



Liquid unit doses are typically formulated differently than HDL on specific parameters to enable PVOH compatibility:

- Low water activity (and low water content, typically < 15w%, often <10% not to dissolve the PVOH)
- **High polyol content**. Typically 15-40%. Often main solvent is MPG, but glycerol are also used.
- **Monoethanolamines** are used as neutralizer to secure high solubility of the surfactants, and levels are often much higher than in HDL, typically 5-10%
- Overall **hydrophobicity** is much higher in unit doses than in HDL.
- **Surfactant** concentrations are typically higher than in HDL; often around 40-60%. Typically mixed LAS/SLES/NI/soap systems are used.
- **Enzymes levels**: recommended to be dosed higher in Unit dose than in HDL to enable similar performance in wash. Often multi enzyme solutions are used.
- **Other ingredients and pH**; typically the same as in HDL.
- For high conc liquid detergents not in the unit dose format, many of the same characteristics apply.

FORMULATING LIQUID DETERGENTS (LIQUID UNIT DOSE LAUNDRY DETERGENTS)

2017-14375

SOLVENTS/ POLYOLS:

Unit dose use solvents to replace water, eg MPG; Glycerol; MPD; DPG. Preferably used mixed polyol and as much water as the PVOH compatibility allows. Usually the more hydrophilic system is better for enz stability. Solvent has impact on PVOH compatibility.

CALCIUM:

Unit dose detergents usually have lower Ca-tolerance than HDL. Use 50-100 ppm Ca2+ for optimal protease and amylase stability or use newer enzyme variants.

FORMULATION pH

Preferably pH 6.5-8.5

ORDER OF ADDITION

Preferably add CaCl2 and Na-formate during heating step and add enzymes individually at the end when temperature is again low.

Do not blend enzymes beforehand but use Novozymes Medley product range

Most "minors" are OK.

OTHERS

Strong chelators are not necessary as "strong" in unit dose system, but should be used with caution or use chelator tolerant enzymes

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ink Tomorrow

Avoid bleach and formaldehyde releasing preservatives and careful on using oxidizing and reducing agents

SURFACTANT SYSTEM:

Likely less important as in HDL. Use mixed surfactant systems keeping anionic : nonionic ratio 1:1 or even better 1:2. MEA-neutralized LAS and soaps are usually used.

CHOICE OF ENZYME:

In many enzyme classes Novozymes offer different enzymes with different strengths and benefits both stability- and performance wise. Use Best in class products.

Some enzyme classes like Lipases and Pectate lyases may need milder formulation space.

PROTEASE INHIBITORS:

Efficient protease inhibitor systems may be needed. Eg. Novozymes protease Evity[®] or Ultra[®] · Na-formate may also be needed.

Borax/Boric acid is not compatible with PVOH film

CONSULT

your Novozymes technical contact for further questions or assistance

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