



# Ingredients to make formulation easy

Our dried surfactants have been specifically developed for the home care market. They are easy to work with and deliver superior performance.

Alongside our standard ingredients, we can create customized surfactants so you can develop the exciting new products your customers demand, wherever they are in the world.

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To help you explore our range, we have grouped them together under:

## LAS – Nansa® Dried Linear Alkylbenzene Sulphonates

LAS creates excellent detergents by incorporating it into powders, compressed tablets and blocks. It is used in a wide range of applications, from toilet blocks and surface cleaners, to laundry detergents.

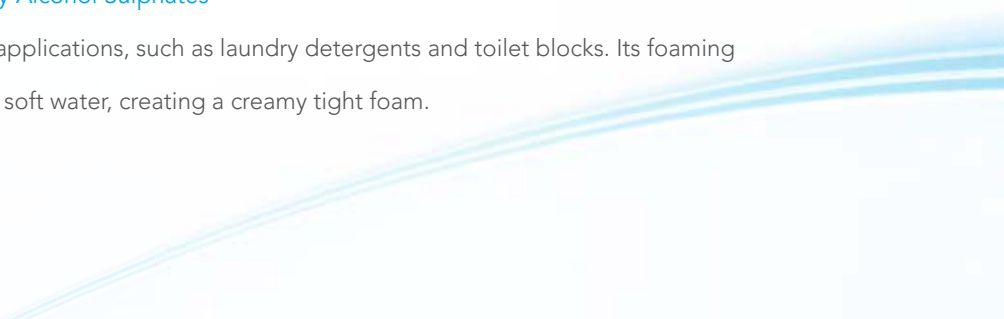
LAS produces an open and voluminous foam structure.

## AOS – Nansa® Dried Alpha Olefin Sulfonates

AOS is ideal for use in all cleaning applications over a wide range of temperatures. It produces high voluminous, stable and luxurious foam, even in hard water. It combines the benefits of alkyl ether sulfates and alkyl sulfates in a single product.

## FAS – Empicol® Dried Fatty Alcohol Sulphates

FAS is ideal for detergent applications, such as laundry detergents and toilet blocks. Its foaming properties perform best in soft water, creating a creamy tight foam.



# dried surfactants

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## A fast growing market

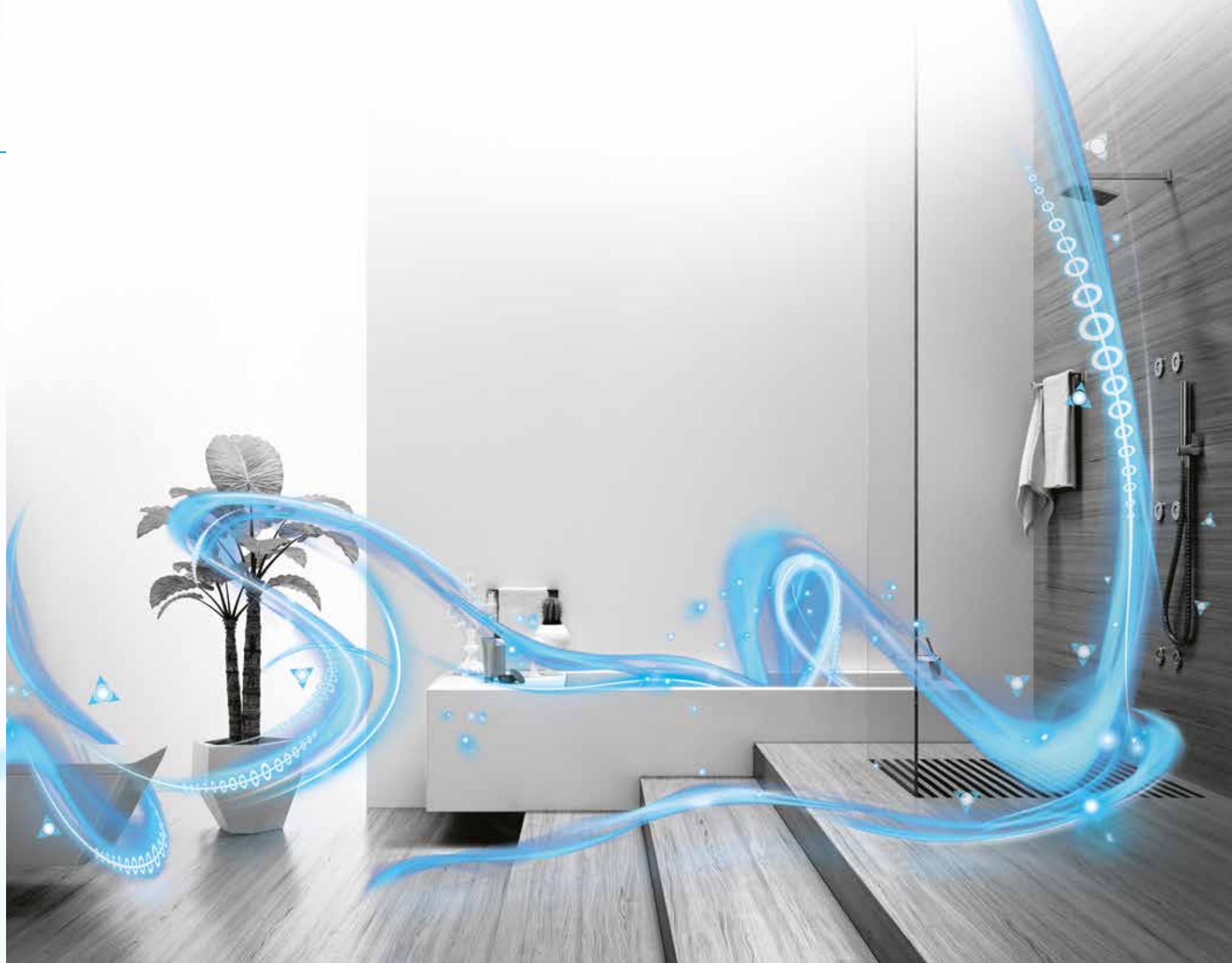
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The global market for home care products is expanding quickly. In the last five years, it has enjoyed a period of robust growth, particularly in the developing world. This trend is set to continue. Populations are rising, wealth is increasing, lifestyles are changing and consumers are demanding more from their home care products.

Innovation and understanding provide the key to tapping into this market opportunity. Laundry, detergent and toilet care products that can match ever higher expectations and push new boundaries will succeed when other products fail. Consumers are demanding home care products that make life easier. They also want detergents that are multifunctional. Smell and visual appeal are increasingly important. Eco-friendly formulations and products that not only clean, but also prevent mould or bacteria forming, are major trends set to shape the market.

Equally important is an understanding of the geographical differences between markets and the ability to respond accordingly. The world is not uniform. Consumers are drawn to different product benefits depending on where they are in the world. So, flexibility is essential to meeting the challenging demands faced by today's formulators.

Our dry LAS, AOS and FAS surfactants play an important role in helping to develop these products of the future. They are easy to work with and easy to transport all over the world. From toilet blocks to washing powder, through detergent tablets and surface cleaners, our ingredients are suitable for a wide range of applications, especially where the requirement is formulations that combine high foamability with effective detergency.







## Your formulation partners

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Solve your next formulation challenge with Home Care from Innospec. We can help you meet the ever-changing expectations of today's consumers. Whether you require standard ingredients or customized formulations for a specific application, we are one of the market leading manufacturers of dried anionic surfactants.

We are committed to continual innovation and developing products that contribute to a sustainable environment. Add in our extensive formulation expertise, market understanding, comprehensive product line-up and excellent customer support. It's not surprising our client list includes some of the world's largest companies.

Above all we understand the global home care market and the difference geography can have on consumer preferences. We know the challenges you face. Put simply, we speak your language. So, use our knowledge to optimize your formulation from day one. We have an in-depth understanding of how dried surfactants perform with other ingredients. Our work on new surfactant technologies and different drying processes is helping to break new ground on dried surfactant performance.

We have the resources and feedstock flexibility to partner with you anywhere in the world. Thanks to our ongoing investment in manufacturing, packaging and quality control systems, we can respond to your needs quickly and efficiently. Our high-quality powders and needles are easy to transport all over the world.

Renowned for our R&D and technical creativity, our scientists have developed ingredients that are used in many of the most popular cleaning brands. Our purpose-built laboratories and analytical testing facilities can evaluate ingredients for their performance, benefits and cost-effectiveness. We will work with you on a one-to-one basis to make sure your finished products not only function exactly as intended, but will also be delivered in a timely fashion.

## Product range at a glance

### LAS – Nansa® Dried Linear Alkylbenzene Sulphonates

Hard water tolerant

Flash foam

Emulsification

Alkaline stable

Acid stable

Wetting

Detergency

Product name	INCI name	Naturally derived	Properties	Features							
Nansa® HS 80/NPF	Sodium Dodecylbenzene Sulfonate	Non-vegetable	80% Active, Powder	Primary Anionic Surfactant. Excellent foaming and detergency properties. Chemically stable in acidic and alkaline conditions. Improved hard water tolerance and limescale reduction properties. Better plasticity and better aesthetics in the final blocks. Ideal for toilet blocks production.							
Nansa® HS 85/NPF	Sodium Dodecylbenzene Sulfonate	Non-vegetable	85% Active, Powder	Primary Anionic Surfactant. Excellent foaming and detergency properties. Chemically stable in acidic and alkaline conditions. Improved hard water tolerance and limescale reduction properties. Better plasticity and better aesthetics in the final blocks. Ideal for toilet blocks production.							
Nansa® HS 90/NPF	Sodium Dodecylbenzene Sulfonate	Non-vegetable	80% Active, Powder	Primary Anionic Surfactant. Excellent foaming and detergency properties. Chemically stable in acidic and alkaline conditions. Improved hard water tolerance and limescale reduction properties. Better plasticity and better aesthetics in the final blocks. Ideal for toilet blocks production.							
Nansa® HS 80/S	Sodium Dodecylbenzene Sulfonate	Non-vegetable	80% Active, Powder	Primary Anionic Surfactant. Excellent foaming and detergency properties. Chemically stable in acidic and alkaline conditions.							
Nansa® HS 85/S	Sodium Dodecylbenzene Sulfonate	Non-vegetable	85% Active, Powder	Primary Anionic Surfactant. Excellent foaming and detergency properties. Chemically stable in acidic and alkaline conditions.							
Nansa® HS 90/S	Sodium Dodecylbenzene Sulfonate	Non-vegetable	90% Active, Powder	Primary Anionic Surfactant. Excellent foaming and detergency properties. Chemically stable in acidic and alkaline conditions.							



## AOS – Nansa® Dried Alpha Olefin Sulfonates

Hard water tolerant

Flash foam

Emulsification

Alkaline stable

Acid stable

Wetting

Detergency

Product name	INCI name	Naturally derived	Properties	Features							
Nansa® LSS 480/H	Sodium C14-16 Olefin Sulfonate	Non-vegetable	80% Active, Powder	Primary Anionic Surfactant. Excellent foaming and detergency. Hard water and electrolyte tolerant. Chemically stable in acidic and alkaline conditions.							
Nansa® LSS 495/H	Sodium C14-16 Olefin Sulfonate	Non-vegetable	95% Active, Powder	Primary Anionic Surfactant. Excellent foaming and detergency. Hard water and electrolyte tolerant. Chemically stable in acidic and alkaline conditions.							
Nansa® LSS 495/V	Sodium C14-16 Olefin Sulfonate	Non-vegetable	95% Active, Needles	Primary Anionic Surfactant. Excellent foaming and detergency. Hard water and electrolyte tolerant. Chemically stable in acidic and alkaline conditions. Optimized physical form for an improved product handling.							

## FAS – Empicol® Dried Fatty Alcohol Sulphates

## Detergency

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511

100%

5

Product name	INCI name	Naturally derived	Properties	Features							
Empicol® LZ/N/MB	Sodium Lauryl Sulfate	100%	92% Active, Powder	Mass Balance RSPO Certified. Primary Anionic Surfactant. Very good foaming and detergency especially in soft water. Good emulsifying properties. Low free alkalinity level.							
Empicol® LZV/B	Sodium Lauryl Sulfate	100%	92% Active, Needles	Primary Anionic Surfactant. Very good foaming and detergency especially in soft water. Good emulsifying properties.							
Empicol® LZV/B/MB	Sodium Lauryl Sulfate	100%	92% Active, Needles	Mass Balance RSPO Certified. Primary Anionic Surfactant. Very good foaming and detergency especially in soft water. Good emulsifying properties.							
Empicol® LZV/BE	Sodium Lauryl Sulfate	100%	92% Active, Needles	Primary Anionic Surfactant. Very good foaming and detergency especially in soft water. Good emulsifying properties. Optimized physical form for an improved product handling.							
Empicol® LZV/BEP	Sodium Lauryl Sulfate	100%	92% Active, Needles	Primary Anionic Surfactant. Very good foaming and detergency especially in soft water. Good emulsifying properties. Optimized physical form for an improved product handling.							
Empicol® LZV/N	Sodium Lauryl Sulfate	100%	92% Active, Needles	Primary Anionic Surfactant. Very good foaming and detergency especially in soft water. Good emulsifying properties. Low free alkalinity level.							
Empicol® LZV/N/MB	Sodium Lauryl Sulfate	100%	92% Active, Needles	Primary Anionic Surfactant. Very good foaming and detergency especially in soft water. Good emulsifying properties. Optimized physical form for an improved product handling.							
Empicol® LZV/N/NEP	Sodium Lauryl Sulfate	100%	92% Active, Needles	Primary Anionic Surfactant. Very good foaming and detergency especially in soft water. Good emulsifying properties. Optimized physical form for an improved product handling.							

# Product overview for formulators

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## Product range

### LAS properties

- Excellent detergents
- Stable in both acids and alkali
- Sensitive to hard water
- Extremely good anionic wetting agent
- Combines wetting, detergency and emulsification
- Open and voluminous foam structure

Ideal for toilet blocks, surface cleaners and laundry detergents

### AOS properties

- Superior detergency to LAS
- Stable in both acids and alkali
- Hard water tolerant
- Superior wetting ability at high electrolyte levels
- Voluminous foam - stable like SLES and luxurious as SLS

Ideal for all cleaning applications



## FAS properties

- Excellent detergents
- Limited stability in acidic conditions
- Sensitive to hard water
- Extremely good anionic wetting agent
- Foaming properties better in soft water
- Creamy tight foam

Ideal for laundry 'detergents and additives' and toilet blocks



## Foam profiles

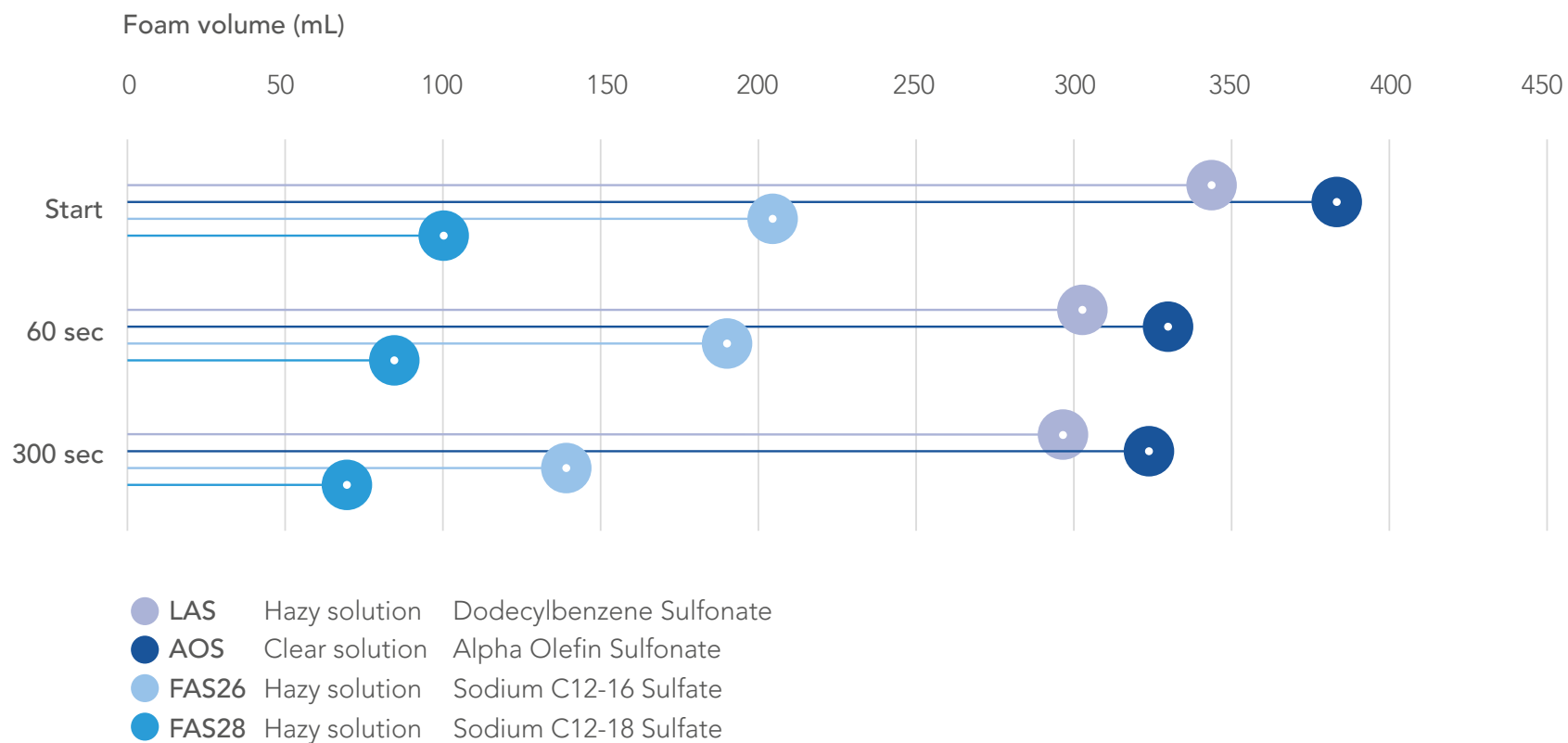
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### Comparison between primary surfactants

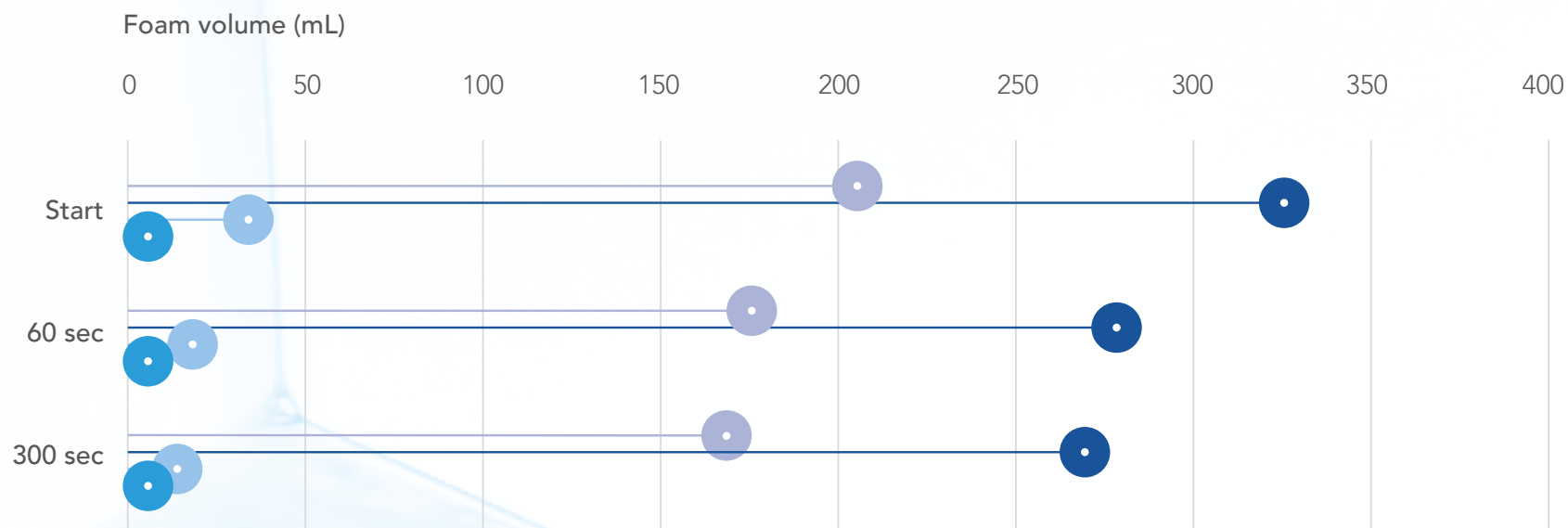
In standard testing conditions, 1000 ppm active matter, at room temperature and in hard water (300 ppm  $\text{CaCO}_3$ ) LAS and AOS exhibit higher foaming profiles than FAS26 and FAS28. Both FAS and AOS produce a denser and luxurious foam (small bubbles) than LAS (large bubbles).

AOS, having higher compatibility with the hard water cations, in the testing conditions, gives a clear liquid. This means that all the surfactant molecules contribute to the foaming generation - this is not the case for LAS and FAS that give hazy solutions.

## Ross-Miles Tests (1000 ppm anionic active matter, 25°C, 300 ppm CaCO<sub>3</sub>)



## Ross-Miles Tests (100 ppm anionic active matter, 15°C, 300 ppm CaCO<sub>3</sub>)



Toilet block formulations based on single primary surfactant at 30%

● LAS	Hazy solution	Dodecylbenzene Sulfonate
● AOS	Clear solution	Alpha Olefin Sulfonate
● FAS26	Pearled solution	Sodium C12-16 Sulfate
● FAS28	Pearled solution	Sodium C12-18 Sulfate

## Foam profiles

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### Toilet blocks

At cold temperature (15°C), in hard water (300 ppm  $\text{CaCO}_3$ ) and at higher dilutions, the differences between the foaming profiles of LAS and AOS in comparison with the FAS are even more evident. Despite the lower temperature and the low concentration, AOS is able to maintain its excellent foaming properties. LAS is still able to disclose its good foam-ability while FAS26 is low foaming and FAS28 is almost no foaming.

Also in this case the AOS solution is clear and this is the reason why it is able to maintain its excellent foaming properties. LAS is still able to perform well, despite the hazyness of its solution, while both the FAS testing liquors are pearlescent so only a small portion of the surfactant molecules can produce foam.

## Optimizing foaming profiles in toilet blocks through surfactant synergies

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Foam profiles produced by toilet blocks based on LAS and AOS alone and in a 1:1 LAS:AOS blend have been also tested at cold temperature (15°C), in hard water (300 ppm  $\text{CaCO}_3$ ) at high dilution levels (100 ppm as anionic active matter).

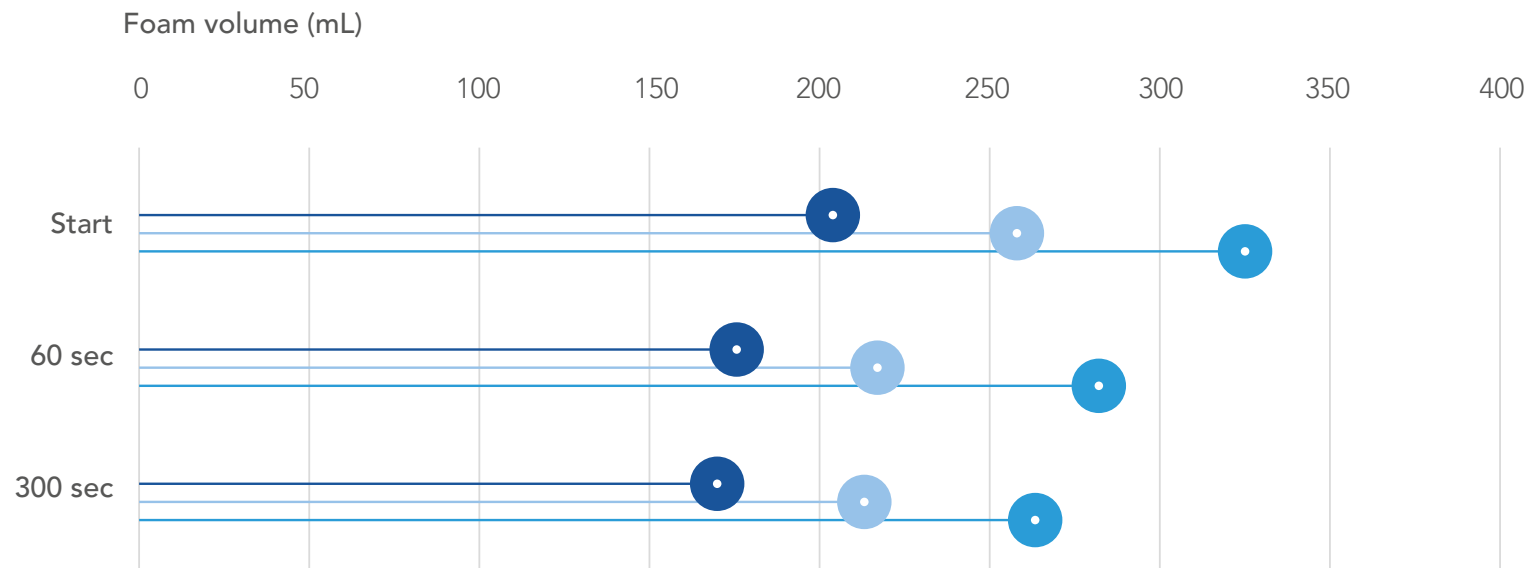
AOS provides an evident improvement to the volume and the quality of the foam that LAS produces when it is used as the sole primary surfactant.

AOS superior hard water tolerance, contributes to solubilization of the LAS molecules helping to get clear testing solutions that achieve excellent foaming profiles also at lower temperatures.

This is the reason why blends of LAS and AOS represent an excellent primary surfactant combination for toilet blocks with superior foaming profiles.



## Ross-Miles Tests (100 ppm anionic active matter, 15°C, 300 ppm CaCO<sub>3</sub>)



Toilet block formulations based on single or surfactant blends at 30%

- |                       |                |   |
|-----------------------|----------------|---|
| ● LAS                 | Hazy solution  | Dodecylbenzene Sulfonate                        |
| ● LAS (15%)/AOS (15%) | Clear solution | Dodecylbenzene Sulfonate/Alpha Olefin Sulfonate |
| ● AOS                 | Clear solution | Alpha Olefin Sulfonate                          |

# Optimizing foaming profiles in toilet blocks through surfactant synergies and foam boosters

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## LAS alone and with foam boosters

Foam profiles produced by toilet blocks based on LAS alone and in combination with an hydrotrope as SCS and SLES as foam boosters didn't show any difference. Hazy solution when based on LAS only; clear solution when based on LAS+LES+SCS.

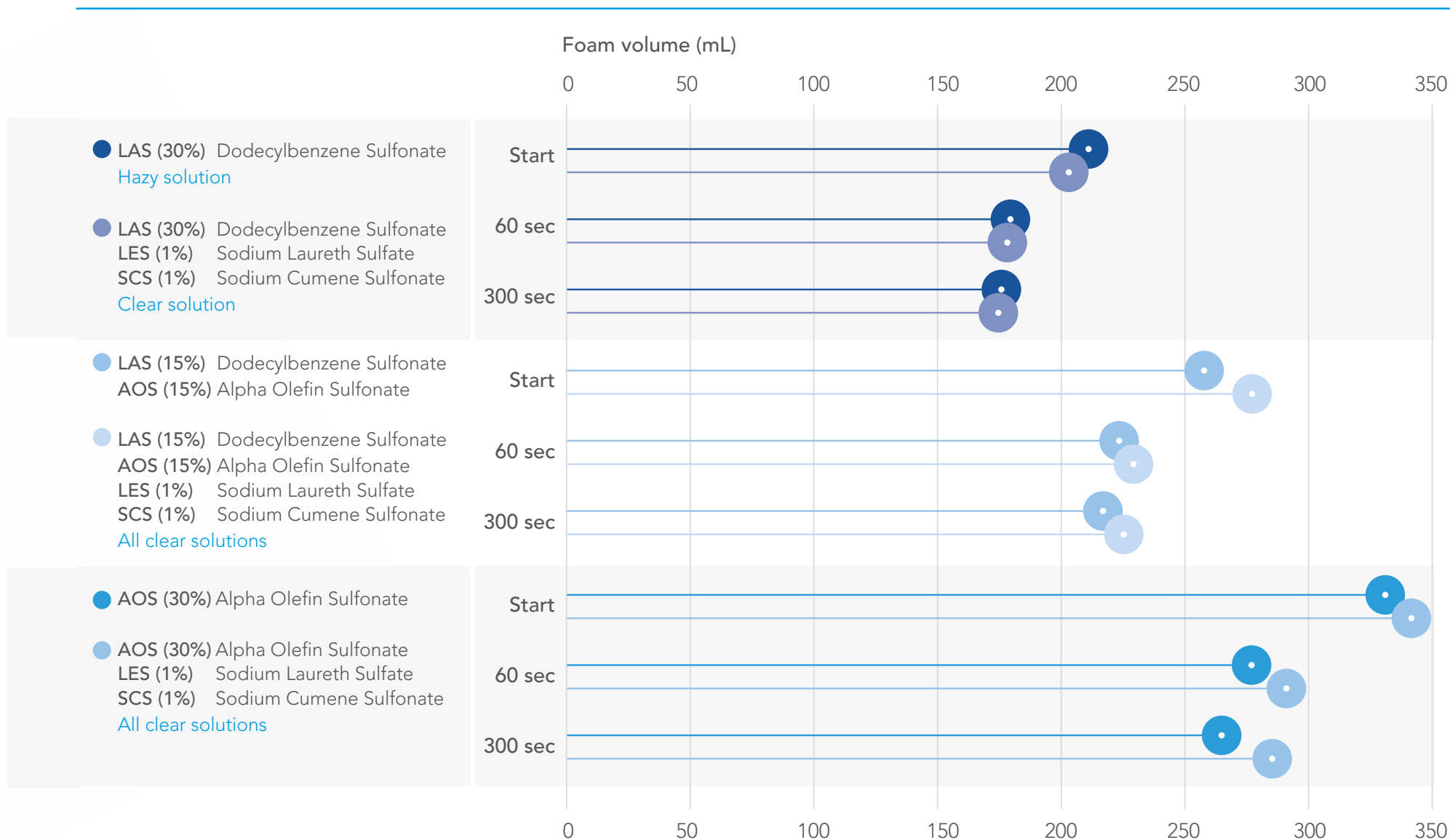
## LAS/AOS blend with foam boosters

Likewise, what has been observed in toilet blocks based on AOS alone, also in the case of formulations based on LAS/AOS blends, the addition of small quantity of SCS and SLES as foam boosters have a beneficial impact on the foam profiles in terms of volume, quality and stability. Also in this case the performance benefits are related to the superior hard water tolerance of the ingredients used for the preparation of toilet block.

## AOS alone and with foam boosters

Small addition of SCS and SLES to a toilet block formulation based on AOS alone have a positive impact on the foam profiles.

## Ross-Miles Tests (100 ppm anionic active matter, 15°C, 300 ppm CaCO<sub>3</sub>)



## Dried surfactants key characteristics overview

	Solubility in water	Foam volume	Foam quality	Hard water tolerance	Wetting power	Labelling	Irritancy on skin	Aquatic toxicity	Naturally derived
LAS – Dried Linear Alkylbenzene Sulfonates	–	+	–	–	+	Corrosive	Skin Irrit. 2 (H315)	Aquatic Chronic 3	NO
AOS – Dried Alpha Olefin Sulfonates	=	+	+	+	+	Non Corrosive < 38%	Skin Irrit. 2 (H315)	NC	NO
FAS – Dried Fatty Alkyl Sulfates	+ =	=	+	–	+	FAS26 & FAS28: Non Corrosive < 20% FAS28: NC < 10%	Skin Irrit. 2 (H315)	Aquatic Chronic 3	YES

**+** Beneficial

FAS26 Sodium C12-16 Sulfate

**=** Average

FAS28 Sodium C12-18 Sulfate

**–** Disadvantage

**NC** Not classified





INNOSPEC addresses today's ever-changing home care landscape with breakthrough products that become key ingredients in our partners' portfolios. We impart the physical and sensory attributes that put their brands through the whole home.

Today's thoughts are tomorrow's innovations. Let's start a conversation...

The facts stated and the recommendations made are based on our own research and/or the research of others, and are believed to be accurate. No guarantee of their accuracy is made, however, and unless otherwise expressly provided by law or in written contract, the materials are sold without warranties, expressed or implied, in particular without guarantee as to suitability for particular purpose. Innospec assumes no responsibility for injury or damage to users or third parties. Recipient agrees to assume all risk and liability whether used singly or in combination with other materials.

V3 : 06. 2019

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