

WASH CLEAN AND GREEN WITH NOVO

The search for balance between green and clean is propelled by growing end consumer demands that their detergents do it all – be environmentally friendly and cost-effective, and offer superior cleaning. Now detergent manufacturers can boost their competitive edge and give their customers what they want by replacing traditional detergent ingredients, such as surfactants, with a multienzyme solution containing the new innovation from Novozymes, Lipoclean.

An alternative to current surfactant technology, Lipoclean is an essential part of any enzyme solution used to replace surfactants in detergents.

By reformulating with performance-boosting enzymes, detergent manufacturers can cost-effectively replace chemicals with readily biodegradable bio-based solutions and allow for low wash temperatures while maintaining or even increasing the cleaning power.

Get sustainability for free

Depending on the detergent formulation and regional variations, detergent manufacturers can now replace, on average, 25% of a detergent's surfactant system with a multienzyme solution containing Lipoclean while stabilizing formulation costs, increasing the sustainability profile of their detergent, and without compromising performance.

“Essentially, detergent manufacturers can get sustainability for free with enzyme reformulation – replace chemicals with readily biodegradable enzymes without increasing costs and get a detergent that is green and washes clean, even when you turn down the wash temperature,” says Sandra Friis-Jensen, Global Launch Manager for detergent solutions at Novozymes.

In terms of percentage of total carbon dioxide emissions, when looking at the carbon footprint of the laundry value chain, Reckitt Benckiser estimates that around 28% of the carbon footprint is made up by packaging of their products, while consumer use accounts for 64%.¹

“If we want to reduce the environmental impact of washing, we must reduce wash temperatures,” says Michael Carlsson Lauesgaard, Regional Marketing Manager at Novozymes. “If

we all wash at 30 °C instead of 40 °C in Europe – and cold instead of warm in the US – it will have a huge impact. In Europe alone, it corresponds to the emissions from 3 million cars in one year. Lipoclean helps consumers wash clean at low wash temperatures – this is an easy way for detergent manufacturers to help consumers reduce the environmental impact of washing.”

In addition, by replacing high-volume ingredients like surfactants with low-volume enzymes, detergent manufacturers can realize compaction. A strong trend in the US, which is finding its way into Europe, compaction reduces the need for storage space and transportation, which translates into carbon dioxide savings.

Can green really clean?

Overall cleaning is on the minds of consumers. In



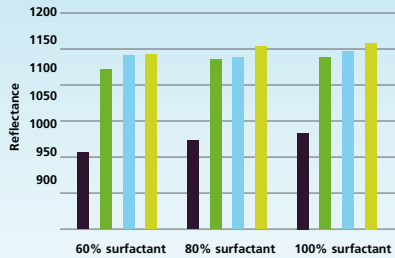
ZYMES LIPOCLEAN®

- Detergent without enzymes (base)
- Base + multienzyme solution without lipase
- Base + multienzyme solution + 0.1 wt% Lipoclean
- Base + multienzyme solution + 0.5 wt% Lipoclean

Multienzyme solution:
protease, amylase,
mannanase, cellulase
(1.5 wt%)

Wash conditions:
EU powder detergent,
5 g detergent/L,
full-scale wash,
40 °C, 15 °dH

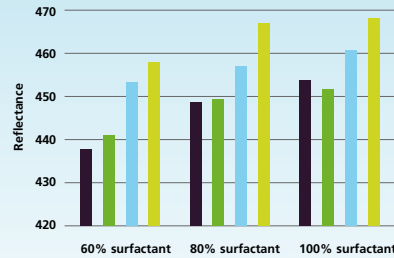
REDUCED SURFACTANTS, NO LOSS OF PERFORMANCE



The stain set includes a variety of technical and food stains (18 stains).

This graph shows that the overall cleaning performance across a variety of stains is either matched or enhanced in a European powder detergent where up to 40% of the surfactant system is replaced with a multienzyme solution containing Novozymes Lipoclean®. In addition, Lipoclean also prevents loss of performance on traditional detergency monitors, such as motor oil and clay.

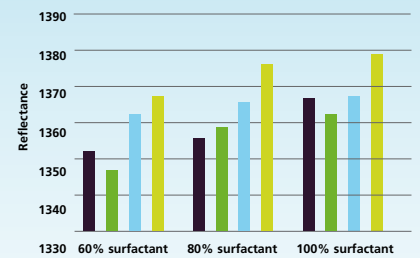
PERFORMANCE OF NOVOZYMES LIPOCLEAN® ON GREASE STAINS



Technical stains used (7):
frying fat, pigment/sebum, pigment/
vegetable fat, oil/pigment, mustard,
beef fat (colored), butter fat (colored)

Surfactants have so far been the main grease removers in a detergent. However, these graphs clearly show that Novozymes Lipoclean® as part of a multienzyme solution more than makes up for the loss of performance caused by reduced surfactant content.

PERFORMANCE OF NOVOZYMES LIPOCLEAN® ON EQUEST STAINS



Equest stains used (6):
hamburger grease, lard, vegetable
fat (solid), vegetable oil, kebab
grease, butter

a survey conducted by Novozymes in 2007 across Germany, Spain, and the US, the top three laundry detergent purchasing criteria for consumers were: stain removal, general cleaning including whitening, and color and fabric care. And the top stains that consumers want to get rid of are: greasy food stains, sweat stains, and cuff and collar soiling.

Among all the traditional ingredients in a detergent, surfactants are the strong grease and sebum cleaners. When levels of surfactants are reduced in a detergent, the cleaning effect goes down. A customized multienzyme solution containing Lipoclean more than compensates for this loss in cleaning performance. In fact, in many cases enzymes offer even better cleaning than surfactants on a broad range of consumer-relevant stains.

“For surfactant replacement, among other things, you need a grease remover; there’s no way around that,” says Sofia Elisson, Research Scientist at Novozymes. “Without Lipoclean, detergent manufacturers cannot replace surfactants. We have proven this by conducting several trials on various detergents from Europe and North America. Lipoclean in a multienzyme solution is an alternative to surfactants and cleans greasy soiling to give consumers a high-performance detergent.”

Decouple from fossil fuels, stabilize costs

The detergent industry has been feeling the squeeze because of fluctuating oil prices coupled with a demand from consumers for better and greener cleaning products.

Oil prices are governed by supply and demand, and an analysis by ExxonMobil from April 2009 indicates that over the next 10 years, oil and gas demand will increase by around 2% a year, while current fields in production will deplete at an average of 3 to 5% per year.² According to the head of commodities for Morgan Stanley, there is a concern about oil prices rising rapidly in the near term – however, the best guess in the long term is only one way and that is up.³

The prices of many detergent ingredients like surfactants have been volatile in the past, often influenced by the price of a barrel of oil. The prices of bio-based solutions like enzymes have not been heavily influenced by oil price fluctuations and have remained stable – and it is fair to conclude that the prices of such solutions will continue to be stable.

“For economic sustainability, manufacturers, regardless of industry, must decouple their costs and production from fossil fuel-based products and turn to bio-based ones. Manufacturers can now replace unstably priced products with stably

priced enzymes like Lipoclean and gain financial stability and formulation flexibility,” says Anders Lund, Marketing Director for detergent solutions at Novozymes. “We invite manufacturers to reformulate their detergents with enzymes – and work with us to change the world of cleaning.” ■

1. Dawes, C, Flower vs. power, Packaging News, November 25, 2008.
2. Jungels, P, President of the Institute of Petroleum, Future Outlook of Oil and Gas Supply and Demand, Touch Oil and Gas, 2009.
3. Money Morning, Oil Prices Due For A Short-Term Setback, Although Long-Term Outlook Remains Bullish, iStockAnalyst.com, July 6, 2009.

FOR MORE INFORMATION

Sandra Friis-Jensen
sfj@novozymes.com

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