



Berol[®] 360 and Berol[®] 366






The next generation of more sustainable high-performance degreasers are vegetable-based narrow range ethoxylates, suitable for use in household, industrial and institutional (I&I) cleaning applications. These two primary surfactants provide outstanding degreasing - achieved with more sustainable raw materials.

Our dedicated cleaning team is always focused on developing new, advanced technologies to help formulators create new products to delight consumers and end-users.

As a result, we are excited to introduce Berol 360 and Berol 366, both of which are new, unique narrow-range ethoxylate (NRE) surfactant degreasers for use in high-performance cleaning formulations. Berol 360 is targeted for tough I&I applications, where performance is paramount. Berol 366 is targeted towards household applications where mildness in use is consumer-preferred. Both materials are produced from vegetable-based raw materials, and the finished products are provided to customers with RSPO-certification.

These technologies have been developed to address the consumer and broader market demand for more environmentally benign products without sacrificing the technical and environmental performance customers expect.

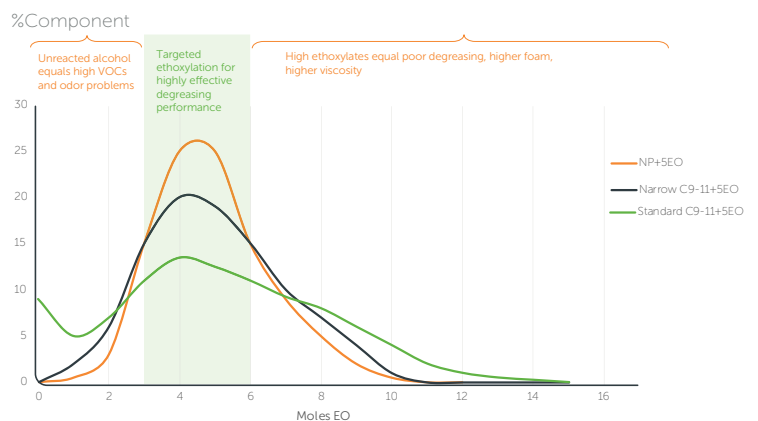
Key benefits

-  Offers proven, efficient degreasing performance coupled with better handling characteristics versus standard ethoxylates in household and I&I applications
-  Performs on a par with synthetic NRE's while providing secondary consumer/regulatory advantages – low odor, low viscosity, more biobased and RSPO-certified
-  Gives formulators a novel choice when formulating green cleaning products
-  Helps answer the consumer desire for more sustainable cleaning
-  Can be incorporated into formulations that can achieve third party sustainability recognition, such as EU Ecolabel

Why narrow range ethoxylates?

In comparison with standard fatty alcohol ethoxylates, NRE's:

- Have a high proportion of **targeted ethoxylation** to give optimized degreasing performance
- Have lower amounts of **unreacted alcohol** which causes odor
- Have lower amounts of **higher ethoxylates** which cause foaming, viscosification and have poor degreasing performance



Made from sustainably-sourced, vegetable oils – RSPO certified

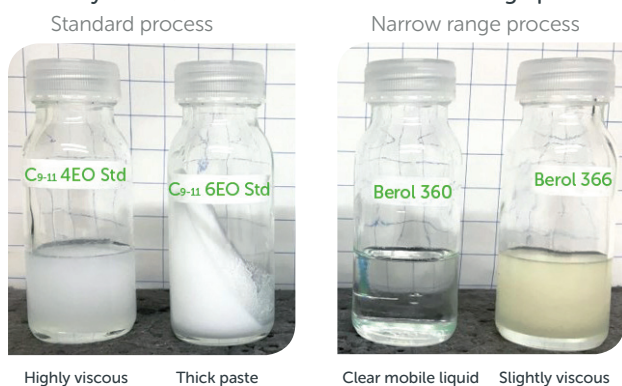
Berol 360 and Berol 366 are both manufactured from a sustainably derived, vegetable-based raw material. As a member of the roundtable on sustainable palm oil (RSPO), Nouryon is committed to finding raw materials from sustainable sources when available, to reduce the upstream environmental impact of our products. They come with RSPO mass balance (MB) certification when issued. These products are also mild in the environment when released, with both products complying at an ingredient level with the requirements of EU Ecolabel and Nordic Swan.

Better material handling

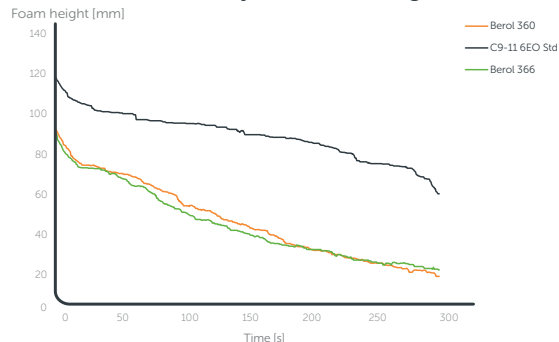
Narrow range ethoxylates have much lower viscosity at reduced temperatures. Lower viscosity (pourpoint) means easier handling and processing in cooler climates. Lower viscosity also provides faster dissolution rates for the product upon formulation. NRE products also generates less foam than standard process ethoxylates, thus a more vigorous agitation can be employed. Comparative foaming test using a Ross-Miles foam analyzer illustrates this.

Appearance at 0°C

Viscosity at 0°C/32°F - Standard vs. narrow range process



Ross-Miles foam analyzer - Foam height at 25°C



Summary of typical properties of vegetable based narrow range ethoxylates

	CMC g/l	Wetting Draves, 25°C, 0.1%, sec	Foaming Ross Miles 50°C, 0.05%, 0-5min, mm	HLB	Cloudpoint, °C
Berol 360	0.04	11	26 - 2	10.5	55-59 (BDG)
Berol 366	0.03	15	59 - 5	12.1	24-29 (water) and 54-59 (water)

Suggested framework formulations

I&I alkaline degreaser

5.0% Berol 360
 3.5% Berol R648 NG or PO
 10% Dissolvine 100-S or GL-47-S
 0.5% NaOH
 Balance Water
 Use conc.: 1:20-1:60

Household all purpose cleaner

2.0% Berol 366
 1.0% Berol R648 NG or PO
 0.4% Dissolvine 10-S or GL-47-S
 Balance water
 Ready to use (trigger spray)

For more information and sample formulations contact us at cleaning@nouryon.com.

USA and Canada

Chicago, USA
 T +1 800 906 9977

China

Shanghai, China
 T +86 21 2220 5000

Europe

Stenungsund, Sweden
 T +46 303 850 00

South America

Itupeva, Brazil
 T +55 11 4591 8938

South East Asia

Singapore
 T +65 6635 5183

Middle East

Dubai, United Arab Emirates
 T +971 4347 2491

Central America and Caribbean

Mexico City, Mexico
 T +52 55 5261 7895

India

Mumbai, India
 T +91 22 6842 6700

Russia

Moscow, Russia
 T +7 495 766 1606

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Nouryon

We create ingredients for the manufacture of life's essentials. You'll find our products all around you, in things like food, buildings, and everyday items like your children's toys.

Sustainability is at the heart of everything we do, and we rank #1 in the Dow Jones Sustainability Index. To keep devising sustainable, innovative solutions for the problems posed by everyday life, we want to work with the very best people and partners – like you.

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