

A major component of the movement toward “greener” cleaning products has involved the replacement of slowly decomposing non-ionic wetting agents with surfactants that offer quicker and more complete biodegradation. In many cases that means replacing an alkylphenol ethoxylate, based on octyl or nonyl phenol or even a random secondary ethoxylate, with an ethoxylated primary linear alcohol. The common test for biodegradability (BOD) measures the quantity of oxygen consumed by microorganisms in degrading a metabolic substrate. Testing shows a standard 9 mole nonyl phenol ethoxylate (NP-9) degrades 30% in 30 days while the equivalent Tomadol® (91-6) degrades 91% in the same time frame. This biodegradability information is widely accepted by environmental agencies on a global basis.

Air Products and FBC can help you accomplish this goal by using the following chart:

<b>NP-4 (or OP-4)</b>	Tomadol® 400	- lower viscosity profile, exceptional cleaning
<b>NP-6 (or OP-6)</b>	Tomadol® 600	- faster wetting and superior soil removal
<b>NP-9 (or OP-9)</b>	Tomadol® 900	- faster solution times and more efficient soil removal
	Tomadol® 901	- excellent for laundry and degreasing
<b>NP-12 (or OP-12)</b>	Tomadol® 1200	- robust emulsifier and cleaner of heavy oils

In many cases, due to the rapid solution times and heavy soil removal, customers have found they were able to use up to 50% less Tomadol® than its corresponding alkylphenol ethoxylate. Often, formulators choose to approach surfactant replacement via the HLB system. They can find products ranging from HLB 7.5 (Tomadol® 25-3) TO HLB 14.4 (Tomadol® 25-12 or Tomadol® 45-13) with the following hydrophobes available: C9-C11, C11, C12-C13, C12-C15, C14-C15. Chemists have found that blending two or more Tomadol® surfactants can result in better detergency and more stable emulsions.

To further enhance the “green” profile, Air Products has launched their Tomadol® L Series products. These surfactants are based on purely vegetable hydrophobes (palm or coconut oil), and fill the need for renewable or bio-based resources. This line of products ranges from HLB 8.0 (Tomadol® L80) to HLB 14.4 (Tomadol® L144).

For a complete list of  surfactant offerings [Contact Us](#) or call 800-446-2340.