

Dynol™ 604 Surfactant: A Fluorosurfactant Alternative

GENERAL DESCRIPTION

Dynol 604 surfactant is an ultra low-VOC*, low-foam, nonionic wetting agent ideal for high-performance waterborne applications. This wetting agent has been found to be an excellent alternative to problematic fluorosurfactants. Unlike fluorosurfactants, and most other surfactant chemistries, this acetylenic-based surfactant has the ability to dramatically reduce both equilibrium (static) and dynamic (high speed) surface tension properties, while providing low foam and low water-sensitivity properties.

PERFORMANCE BENEFITS

Dynol 604 surfactant promotes substrate wetting of waterborne systems such as coatings, inks and adhesives. It is also effective at providing both wetting and flow and leveling in concrete sealant and floor polish applications, for example, while not causing foam or recoatability problems commonly experienced with fluorosurfactants. This surfactant can also act as a pigment wetting agent to enhance dispersion quality, often significantly increasing its stability.

TYPICAL PROPERTIES

Appearance	Amber Liquid
Specific Gravity (25°C)	0.974
Flash Point (°F)	327
VOC (EPA Method 24)	<1.5
Activity	100

TABLE 1

Surfactant Performance Comparison at 0.1 wt.% in Water		
Surface Tension (dynes/cm ¹)		
	Equilibrium	Dynamic
Dynol 604	25.8	28.4
Fluorosurfactant ²	21.2	72.4

“Best of Both Worlds”

Dynol 604 surfactant can provide many of the benefits seen with a fluorosurfactant without the drawbacks, yet in some systems, combinations of Dynol 604 with anionic or nonionic fluorosurfactants may extract the optimum performance of both technologies. These benefits include excellent flow/leveling, substrate wetting, good pore penetration (i.e. wood), high gloss, improved foam control and good dynamic wetting characteristics. Figure 1 illustrates the potential synergy found through the combination of these surfactant chemistries

* Volatile Organic Compounds

¹ Equilibrium surface tension measured on the Kruss BP23 at 1 bubble/sec; Dynamic measured at 6 bubbles/sec.

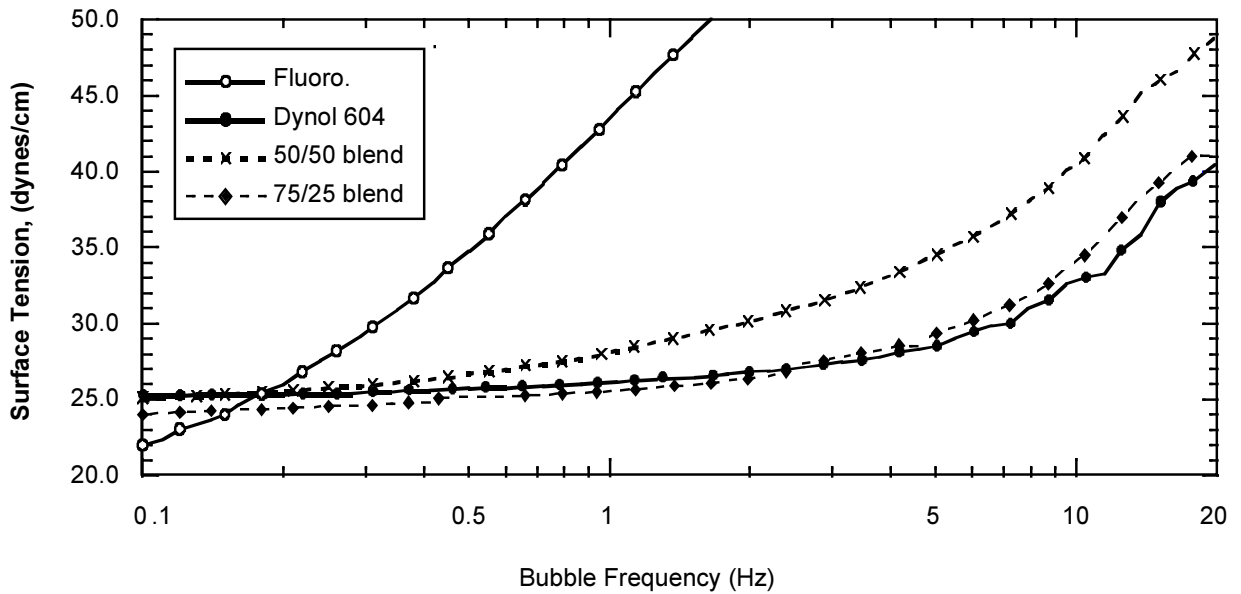
² Anionic fluorosurfactant, added at “as received” activity

In Figure 1, Dynol 604 surfactant is blended at both 50/50 and at 75/25 ratios with an anionic fluorosurfactant and evaluated for surface tension at low and high bubble rates. The low bubble rates are representative of equilibrium performance, and the higher bubble rates are representative of dynamic performance. The data clearly indicates that increasing addition of Dynol 604 to the fluorosurfactant improves the equilibrium performance over the Dynol 604 surfactant alone, but also dramatically improves dynamic surface tension performance over the fluorosurfactant alone. This improved dynamic performance should provide much better coating results under high speed application methods such as spray or high speed roller, yet retain many of the Dynol 604 surfactant benefits of better foam control, less water sensitivity and good recoatability.

Conclusion

Alone, or in combination with fluorosurfactants, the Dynol 604 surfactant technology provides the formulator excellent latitude in solving a multitude of waterborne formulating challenges.

Figure 1



For Samples or More Information Europe

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