Micronized Fischer-Tropsch waxes in water-based inks

Water-based inks

Demand for water-based inks is growing due to the growth in flexible packaging, a rise in demand for printing inks and an increased awareness of environment and safety issues. Waxes are used as additives in printing inks to improve the resistance of the ink film to rubbing, scratching and scuffing; and to serve as a slip aid. Utilising the Fischer-Tropsch (FT) process together with state-of-the-art fractionation and micronization facilities, Sasol Performance Solutions manufactures specialized wax grades in micronized form to satisfy the needs of water-based inks in different printing processes and various substrates.

Fischer-Tropsch waxes are not considered as polymers in the sense of ECHA (European Chemicals Agency) and are not classified as microplastics.

Wax	Styrene-acrylic based black ink				Styrene-acrylic based red ink			
	Gravure (high-gloss paper)			Flexographic (craft paper)	Gravure (high gloss paper)			Flexographic (craft paper)
	Gloss retention	Rub resistance	COF reduction	COF reduction	Gloss retention	Rub resistance	COF reduction	COF reduction
SASOLWAX Spray 30	○	●	○	○	○	○	●	○
SASOLWAX Spray 30G	○	○	○	○	○	○	●	○
SASOLWAX Spray 30G-EF		○	○		○	○	●	○
SASOLWAX H1N4-G	○	○	○		○	●	○	○
PE wax 1	○		○	○	○	○		○
PE wax 2	○		○	○	○	○	○	
SASOLWAX Aqua 30G	○	○	●	●	○	●	○	●
SASOLWAX Aqua 30G-EF		○	○	●	○	○	○	●
Ox-PE wax	○	○	○	●	○	○	○	○

● premium performance ○ good performance

Note: The above results are extracted from a study conducted by an independent third party to compare Sasol's FT waxes to PE waxes which are considered as industry benchmarks. PE wax 1 is a micronized PE wax with melting point 115–121°C, d50 particle size 8 µm, and density @ 20°C 950–960 kg/m³.
PE wax 2 is a micronized PE wax with melting point 120°C, d50 particle size 6µm, and density@ 20°C 950 kg/m³.
Ox-PE wax is a micronized oxidised PE wax with melting point 137°C, d50 particle size 6.0–7.5 µm, and density@ 20°C 990 kg/m³.

Sasol's Fischer-Tropsch hard waxes are attractive alternative products to polyethylene waxes traditionally used in water-based inks to improve rub, scratch and scuff resistance and to improve slip. SASOLWAX Spray 30 and Aqua 30G can outperform micronized polyethylene waxes and are recommended FT waxes for use in water-based inks.

The unique characteristics of Sasol's Fischer-Tropsch micronized waxes ensure an ideal performance in water-based ink formulations:

- Synthetic production, resulting in consistent high quality with low level of impurities
- Low viscosity with excellent thermal stability
- A high degree of linearity
- A high degree of crystallinity
- Very low surface tension
- A high level of hardness
- A wide range of grades with tailored particle sizes and distribution

Typical data	Congealing point (°C)	Drop melting point (°C)	Penetration at 25°C (1/10 mm)	Color	Molecular weight (Dalton)	Particle size (µm)	
						d50	d90
Spray waxes (spherical morphology)							
SASOLWAX Spray 30	96–100	112	<1	White	880	5–7	11–14
SASOLWAX Spray 105	102–108	117	<1	White	1,110	5–7	11–14
Ground waxes (irregular morphology)							
SASOLWAX Spray30G-EF	96–100	112	<1	White	880	4–5	8–10
SASOLWAX Spray 30G	96–100	112	<1	White	880	5–7	11–14
SASOLWAX Spray 30G-M	96–100	112	<1	White	880	9–11	20–26
SASOLWAX Spray 30G-L	96–100	112	<1	White	880	11–13	25–31
SASOLWAX H1N4-G	96–100	112	<1	White	880	6–8	15–18
SASOLWAX Spray 105G-EF	102–108	117	<1	White	1,110	4–5	8–10
SASOLWAX Spray 105G	102–108	117	<1	White	1,110	5–7	11–14
Functionalized ground waxes							
SASOLWAX Aqua 30G-EF	95–104	>95	<1.5	Off-white	1,130	4–6	9–11
SASOLWAX Aqua 30G	95–104	>95	<1.5	Off-white	1,130	6–8	13–15

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