MARCUS OIL & CHEMICAL

Marcus NAT Wax—Hydrogenated Soy Wax

Naturally Derrived Waxes

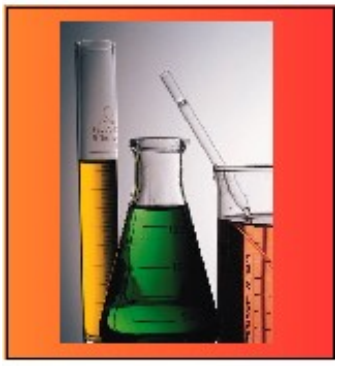
Marcus NAT 155 and NAT 180 are natural waxes derived from soy oil that has undergone selective hydrogenation.

Because these polymers are derived from natural oils, they are good candidates for food based applications such as fruit coatings (consult specific FDA regulation for limitations).

Marcus NAT waxes have good barrier properties yet will saponify under alkaline conditions to allow for easy dispersion.

Marcus NAT 155 and NAT 180 - Typical Properties

Property	NAT 155	NAT 180
Color (Lovebond)	1.5	4 Max
Iodine Value (cg/g)	5	5 Max
Acid Value (mg/g)	1	1 Max
Saponification (mg/g)	180	185-195
Melt Point (° F)	155 - 160	180-185
Hardness (dmm)	2	2



Marcus NAT waxes are a new generation of naturally derived waxes that make ideal substitutes in many applications for petroleum, synthetic and other more expensive natural waxes.

Applications include their use in paper coatings, adhesives, inks and emulsions[1].

NAT waxes are derived from the oil extracted from soybeans that has been degummed and purified. The oil is then hydrogenated to a very low Iodine Value (IV) to transform the oil into a solid.

The basic chemical nature of **NAT** is that of a triglyceride. The melt point of a hydrogenated triglyceride generally depends on the degree of hydrogenation. Hydrogenation eliminates double bonds present in the naturally occurring oil and renders the molecule more linear. For this reason low IV, hydrogenated soy wax, such as **NAT 155**—tends to be very crystalline and hard.

As with other triglycerides, the molecule can be saponified and the molecule split into its fatty acid and glyceride components.

1. NOTE: Production and application of hydrogenated natural oils is covered under US and international patents and patents pending including: US 6,811,824;US 6,890,982;US 7267743;US 8138250;US 7776928;US 7910758; US 8491778; US 8491777; US 8734725; US 8506888; US 8669401

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