

## Overview

The BioForming<sup>®</sup> process converts plant-derived feedstocks into a BioFormate<sup>®</sup> product that is analogous to petroleum reformat. Similarly to conventional petroleum reformat, Virent's Bioreformat product can be used as a gasoline blendstock or processed to high purity aromatic chemicals using conventional aromatics processing technology. Virent's products are indistinguishable from the petrochemical analogs, except for C-14 dating for bio-content. Using conventional aromatics processing Virent has produced renewable paraxylene, mixed xylenes, toluene, benzene and Aromatic 100.

## Key Properties

### Composition

BioForm Aromatic 100 falls within the typical industry specifications for Aromatic 100 solvents. BioForm Aromatic 100 is a mixture consisting of predominantly trimethylbenzenes, along with other C9 hydrocarbons. With its aromatic content of >99%, it imparts good solvency with negligible sulfur content.

### Interchangeable

BioForm Aromatic 100 is a renewable bio-based replacement for petrochemical aromatic 100 that meets typical industry specifications. Substitution for conventional aromatic 100 solvents should require little to no change in formulation.

### Green House Gas (GHG) Reduction

BioForm Aromatic 100 helps meet sustainability goals. Depending on the feedstock used to produce BioForm Aromatic 100, it will reduce the GHG up to 70% versus petrochemical aromatic 100 solvents. Radio carbon dating supports that the carbon content of BioForm Aromatic 100 is bio-based.


### TSCA Listing

Virent's BioForm Aromatic 100 is TSCA listed. Product registrations in other regions, including

REACH, will be obtained prior to commercialization. Consult the SDS for additional information.

## Applications

Virent's BioForm Aromatic 100 is renewable replacement for petrochemical derived typical aromatic 100 solvents. Aromatic 100 solvents are effective solvents in a number of applications including adhesives, agricultural formulations, coatings (paints, varnishes, lacquers, textile) cleaning and polishing formulations, inks, resins, and many other applications. They are also effective solvents for various resins, including numerous acrylic, alkyd, epoxy and polyester resins. Aromatic 100 solvents are also effective solvents for removal of water by azeotropic distillation.

Property	Method	Typical Industry Specification		
			Specification	Actual <sup>(3)</sup>
<b>Aromatics Content</b>	ASTM D4492 <sup>(1)</sup>	98 - 99	≥ 99 wt%	>99.8%
<b>Distillation, IBP</b>	ASTM D86	> 149 °C	> 155 °C	165 °C
<b>Distillation, DP</b>	ASTM D86	< 180 °C	< 180 °C	177 °C
<b>Flash Point</b>	ASTM D56	> 38 °C	> 38 °C	47 °C
<b>Nonaromatic hydrocarbons<sup>(1)</sup></b>	ASTM D4492 <sup>(1)</sup>	N/A <sup>(2)</sup>	≤ 0.5%	<0.15%
<b>Benzene</b>	ASTM D4492 <sup>(1)</sup>	<1% <sup>(2)</sup>	≤ 0.05%	0.006%
<b>Total Sulfur</b>	ASTM D5453	N/A <sup>(2)</sup>	< 1 ppm	Pass <sup>(4)</sup>
<b>Appearance</b>	ASTM D2090	Clear and sediment-	Clear and sediment-	Pass
<b>Color, maximum</b>	ASTM D1209	30 min Saybolt	10 Pt-Co	<5
<b>Mean Biobased Content</b>	C-14	N/A	> 99%	100% <sup>(4)</sup>

(1) Method modification available upon request  
 (2) Typically not specified  
 (3) Production Lot OP2666-2  
 (4) Based on co-product analysis

### For additional information:

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