



## Low-odor alkyd resins with dearomatized fluids from ExxonMobil

Resins and hydrocarbon fluids are key ingredients that determine the quality of coating. Paint formulations that use alkyd resins are extensively used in surface coatings. Compared with acrylic binders, they provide:

- Good mechanical properties,
- Fast drying speed,
- High gloss, and
- Lower cost.

Paint users are increasingly demanding formulations that improve stringent OEL\* durability and performance. A low-odor paint formulation provides balanced performance along with enhanced exterior weathering, durability and gloss retention.

The switch to a low-odor paint formulation requires both the availability of suitable low-odor alkyd resins, as well as an understanding of the benefits of low-odor paints.

ExxonMobil is a leading global hydrocarbon fluid manufacturer, providing high quality products to various resin suppliers and paint formulators.

To provide better solutions to our customers, we collaborated with PT Citra Resins Industries, a key regional resin supplier in Asia, to learn how dearomatized fluid Exxsol™ D40 can perform better in low-odor paint formulations.

**ExxonMobil's dearomatized fluids enable PT Citra Resin Industries to offer a low-odor resin as a replacement for white spirit-based resin.**



Lower odor, low aromatic; low VHR risks and a less stringent OEL\*



Offers good paint performance: good flow-ability, brush-ability and drying time



Enhanced weathering, exterior durability and gloss retention



Maintain formulation cost effectiveness

\*OEL: Occupational Exposure Limit  
 VHR: Vapor Hazard Ratio

For this study, Exxsol™ D40 fluid was selected to be used in a paint formulation with Citrakyd™ 1927, a long oil alkyd resin. Exxsol D40 is a proven solution that enables cost-efficient reformulations while balancing viscosity needs and performance. Exxsol D40 offers a less stringent OEL and lower VHR risks, odor, and aromatics versus white spirit.

## 17x lower in odor with good paint performance

Good flow-ability, brush-ability and drying time.



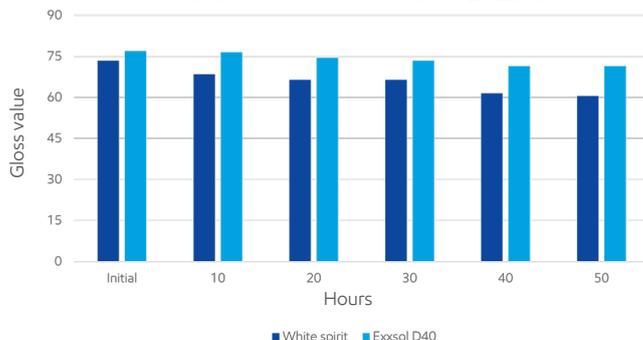
Recommendation	White spirit	Exxsol™ D40
Aromatic content, %	5 - 25%	< 0.001 <sup>1</sup>
Color <sup>2</sup>	9.8	7.2
Odor <sup>3</sup>	Reference	Up to 17x lower
Occupational exposure limit (OEL) <sup>4</sup> , mg/m <sup>3</sup>	300	1200
Vapor hazard ratio <sup>5</sup> (VHR) at 20°C	40	6
Pros	Lower viscosity	Lower odor Better OEL & VHR Better gloss Better exterior weathering

## 7-10% improved weathering

Achieve better gloss performance and weathering by using Exxsol D40 in the paint formulation.



Gloss performance of paints based on test method ASTM D523-08



## 5-10% reduction in resin use

Maintain formulation cost with less paste/resin use<sup>6</sup>.



Raw materials	Formula 1	Formula 2
Paste	60%	57%
Resin long oil alkyd*	25%	23%
Additives	3%	3%
Solvent	12% (white spirit)	17% (Exxsol D40 fluid)
<b>Total</b>	<b>100%</b>	<b>100%</b>

1 Test method: AMS 140.31, ExxonMobil data

2 Data source: Spectrocolorimeter PFXi from PT Citra

3 St Croix Sensory Solvent Odor Comparative Analysis, August 2016

4 ExxonMobil recommended OEL using Reciprocal Calculation Procedure. (A method for calculating Occupational Exposure Limits (OELs) for UVCB hydrocarbon solvents.) UVCB=Substances of unknown or variable composition, complex reaction products or biological materials. For more information about RCP, visit: [https://www.esig.org/reciprocal\\_calculation\\_procedure\\_1/](https://www.esig.org/reciprocal_calculation_procedure_1/)

5 Vapor hazard ratio (VHR) is a solvent's ability to evaporate as a ratio to the occupational exposure limit (OEL)

6 Standard formulation from PT Citra, only for reference

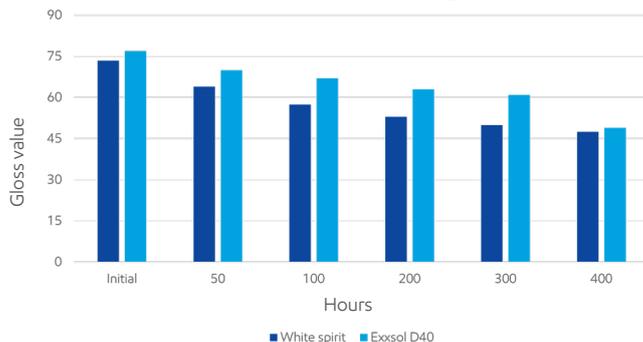
Note: Unless otherwise noted, all the test results are from PT Citra Resins; ExxonMobil only provides Exxsol™ D40 fluid, all the experimental data are generated by PT Citra Resins unless otherwise noted

### \*Citrakyd™ 1927 specifications

Oil type	
Oil length	65%
Solid content	70%
Poliol type	Pentaerythritol

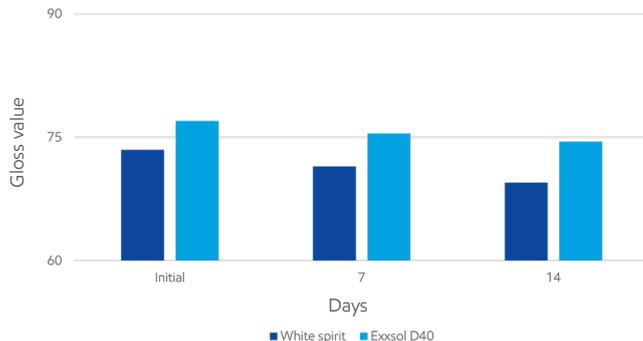
Q-UV test (Gloss 60°)

based on test method ASTM D4587-11



Exterior weathering test (Gloss 60°)

based on test method ASTM G154



Technical question?

Connect directly with our technical experts at [fluidsanswerperson@exxonmobil.com](mailto:fluidsanswerperson@exxonmobil.com)

[exxonmobilchemical.com](http://exxonmobilchemical.com)

[citraresins.com](http://citraresins.com)



Scan to contact us

©2022 ExxonMobil. ExxonMobil, the ExxonMobil logo, the interlocking "X" device and other product or service names used herein are trademarks of ExxonMobil, unless indicated otherwise. This document may not be distributed, displayed, copied or altered without ExxonMobil's prior written authorization. To the extent ExxonMobil authorizes distributing, displaying and/or copying of this document, the user may do so only if the document is unaltered and complete, including all of its headers, footers, disclaimers and other information. You may not copy this document to or reproduce it in whole or in part on a website. ExxonMobil does not guarantee the typical (or other) values. Any data included herein is based upon analysis of representative samples and not the actual product shipped. The information in this document relates only to the named product or materials when not in combination with any other product or materials. We based the information on data believed to be reliable on the date compiled, but we do not represent, warrant, or otherwise guarantee, expressly or impliedly, the merchantability, fitness for a particular purpose, freedom from patent infringement, suitability, accuracy, reliability, or completeness of this information or the products, materials or processes described. The user is solely responsible for all determinations regarding any use of material or product and any process in its territories of interest. We expressly disclaim liability for any loss, damage or injury directly or indirectly suffered or incurred as a result of or related to anyone using or relying on any of the information in this document. This document is not an endorsement of any non-ExxonMobil product or process, and we expressly disclaim any contrary implication. The terms "we," "our," "ExxonMobil Chemical" and "ExxonMobil" are each used for convenience, and may include any one or more of ExxonMobil Product Solutions Company, Exxon Mobil Corporation, or any affiliate either directly or indirectly stewarded. F0722-615E15