

CAN A SURFACE BE LEVELED TO THE NEXT LEVEL?

Empowering Surfaces with **Tivida® FL** enables perfect surface wetting for water- and solvent-borne coatings



UNIQUE TECHNOLOGY

To even out surfaces, sometimes you need immense power: a steamroller. To push your surface results to the next level, we provide an ingenious solution: Our Tivida® FL product range employs a unique technology – branched ultrashort-chain fluorosurfactants. It combines nontoxic and nonbioaccumulative behavior with superb performance to create beautiful, glossy surfaces for water- and solvent-borne coatings.

TIVIDA® FL ANIONIC FLUROSURFACTANTS

Our Tivida® FL products 2200, 2300 and 2500 are surfactants that contain fluorinated alkyl groups. Compared to silicon or hydrocarbon surfactants, fluorosurfactants generally demonstrate a much better reduction of surface tension, resulting in greatly improved performance.

Tivida® FL enables you to create improved coating formulations for a multitude of substrates such as wood, plastic or metal surfaces. By reducing the surface tension to a minimum, Tivida® FL improves

wetting, spreading and leveling in various applications, even on the most critical surfaces. The high level of gloss associated with Tivida® FL makes it your first choice for demanding applications such as floor polishes, among others.

there is
**More to
explore**

"More to explore" is our brand promise. That's because we offer far more than solutions just for surface wetting. We are the creative possibility developer.

With inventiveness, expertise and specialty chemicals, we develop valuable functional future-oriented solutions to empower your surfaces and simplify the identification of your products.

Explore more on our website:
moretoexplore.info

Empowering Surfaces

We offer materials for superior optical and functional coatings

Simplifying Identification

We provide materials for durable and secure recognition and detection

PEERLESS PRODUCTS

Faced with critical or contaminated surfaces? Defects such as pinholes, cratering, dewetting or fatty contaminations? Tivida® FL paves the way to flawless coatings. As you can see in the following examples, it demonstrates effective results in a great variety of applications.

OUR FIRST-CLASS FLUROSURFACTANTS FOR

Wood coating

Our tests show that an 80:20 mixture of FL 2300 and FL 2500 is the best solution for improved wetting in wood coating applications.



Contaminated wood panel: Right side is perfectly coated with Tivida® FL, while left side without Tivida® FL shows imperfect wetting.

Floor polish



Tivida® FL stands for perfect wetting in floor polish applications.

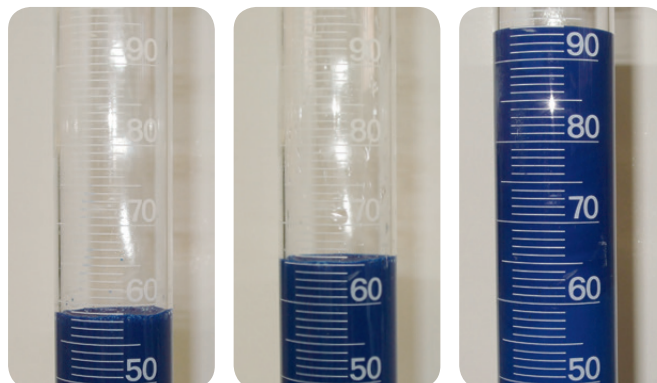
Tivida® FL are top-performing and eco-friendly fluorosurfactants. They enable perfect surface wetting, spreading and leveling in a wide range of solvent- and water-borne formulations by reducing surface tension. The improved surface wetting is the solution for perfect coatings on wood, plastic, paper or metal surfaces as well as floor polish or printing applications.

TIVIDA® FL PAVES THE WAY TO FLAWLESS COATINGS

- High performance – significantly improved wetting
- Efficiency – extremely low usage rate
- Eco-friendliness – less hazardous for users

FOAMING BEHAVIOR

Using our Tivida® FL means using less defoamer in the application, which saves time and effort.



These three photos show a standard foam test of Tivida® FL versus a C6 competitor. Left: sample without fluorosurfactant; center: Tivida® FL; right: C6 competitor.

PROVEN RESULTS

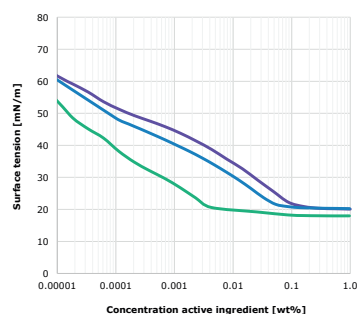
TECHNICAL DATA

	TIVIDA® FL 2200	TIVIDA® FL 2300	TIVIDA® FL 2500
Item No.	100426	101724	102458
Appearance	Liquid	Liquid	Liquid
Density (g/cm ³)	1.15	1.05	1.20
Content of active ingredient (wt%)	50	30	30
Solvent	1-Methoxy-2-propanol	1-Methoxy-2-propanol	1-Methoxy-2-propanol
Anionic/nonionic	Anionic	Anionic	Anionic
Counter ion	Na+	Na+	Na+
Dosage recommendation (wt%) active ingredient product as delivered	0.005 - 0.1 0.010 - 0.2	0.005 - 0.1 0.015 - 0.3	0.005 - 0.1 0.015 - 0.3
Dynamic surface tension (mN/m), max. bubble lifetime (0.1 wt% active ingredient in H ₂ O)	0.1 s: 23 1 s: 21 60 s: 20	0.1 s: 26 1 s: 21 60 s: 20	0.1 s: 58 1 s: 21 60 s: 16
Static surface tension (mN/m)	22.9	22.9	18.9
Foaming behavior (mm), (0.1 wt% active ingredient in H ₂ O, measurement based on Ross-Miles ASTM D 1173)	60 s: 53 180 s: 53 300 s: 52	60 s: 55 180 s: 55 300 s: 55	60 s: 55 180 s: 55 300 s: 55

The technical data shown represent typical values measured for Tivida® FL products that, however, do not replace a specification, which is available for each lot.

SURFACE TENSION IN WATER

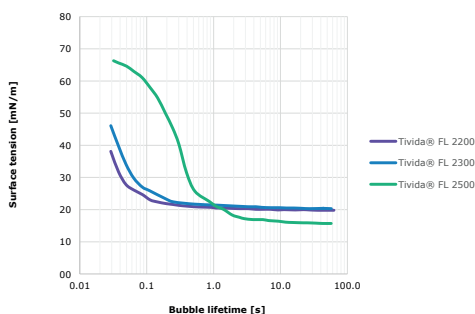
Static surface tension in water (Wilhelmy plate method)



Left graph: The efficiency of the Tivida® FL range is illustrated by measuring the static surface tension in water. A surface tension level of 20.62 mN/m is achievable with just 0.005% FL 2500 (active ingredient) in water.

Right graph: Tivida® FL 2200 and 2300 reduce the surface tension to 22.9 mN/m exceptionally fast in less than 0.2 seconds. These results are measured in water.

Dynamic surface tension in water (Maximum bubble pressure method)



Do you need a Technical Data Sheet? Just scan the barcode to reach our Tivida brand page: <https://www.emdgroup.com/en/brands/pm/tivida/tivida-fl.html>. Select one of the Tivida® FL products and click on "downloads TDS" or check out the full documentation package with MSDS and COA.



ECO-FRIENDLY

Our distinctive branched ultrashort-chain **C2** and **C3** fluorosurfactant technology has been tested according to OECD standards. The following environmental data apply to the individual Tivida® FL products.

Our solution is a superior molecular design

The Tivida® FL product line's success lies in its unique molecular design. As opposed to standard long-chain (C6) fluorosurfactants, Tivida® FL has a branched structure with ultrashort fluorinated alkyl groups (C2 and C3). This structure allows our Tivida® FL surfactants to achieve top performance in a broad range of coating formulations while at the same time being non-toxic, nonbioaccumulative and environmentally friendly. Competitor materials with standard linear long chains need to constantly maintain a balance between performance and toxicity/bioaccumulation. With Tivida® FL, you enjoy the advantages without any compromises until 2020 and beyond.



- Do not contain, are not produced from, and will not degrade to PFOS, PFOA or other substances listed in the OECD "Lists of PFOS, PFAS, PFOA, PFCA, related compounds and chemicals that may degrade to PFCA" (2007 revision)
- Will not degrade to perfluoroalkyl carboxylic or sulfonic acids $\geq C4$
- Thus Tivida® FL is not subject to REACH PFOA Restriction and will continue to be used in the EU market after 2020
- Tivida® FL 2200, FL 2300 and FL 2500 cause no acute oral or inhalation toxicity; no acute aquatic toxicity or bioaccumulation potential in aquatic environments
- Gene mutation and chromosome aberration assays show no mutagenicity for Tivida® FL 2200, FL 2300 and FL 2500
- Tivida® FL products meet the goals of the voluntary U.S. EPA 2010/15 PFOA Stewardship Program

ORDERING INFORMATION

Product Line	Product Name	Item No.	Package Sizes
Tivida® FL	Tivida® FL 2200	100426	50 g, 1 kg, 25 kg, 200 kg
Tivida® FL	Tivida® FL 2300	101724	50 g, 1 kg, 25 kg
Tivida® FL	Tivida® FL 2500	102458	50 g, 1 kg, 25 kg

Handling: For full information please refer to the Material Safety Data Sheet. Do not release into the environment.

Products are warranted to meet the specifications set forth on their label/packaging and/or certificate of analysis at the time of shipment or for the expressly stated duration. EMD provides information and advice on application technologies and relevant regulations based upon its current knowledge and opinion. EMD MAKES NO REPRESENTATION OR WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE REGARDING OUR PRODUCTS, THEIR APPLICATION OR ANY INFORMATION PROVIDED IN CONNECTION THEREWITH. EMD shall not in any event be liable for incidental, consequential, indirect, exemplary or special damages of any kind resulting from any use or failure of the products. Customer is responsible for and must independently determine the suitability of EMD's products for its products, intended use and processes. The foregoing information and suggestions are also provided without warranty of non-infringement as to intellectual property rights of third parties and shall not be construed as any inducement to infringe the rights of third parties. Customer shall be responsible for obtaining any applicable third party intellectual property licenses. All sales are subject to EMD's complete Terms and Conditions of Sale. Prices are subject to change without notice. EMD reserves the right to discontinue products without prior notice.

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