



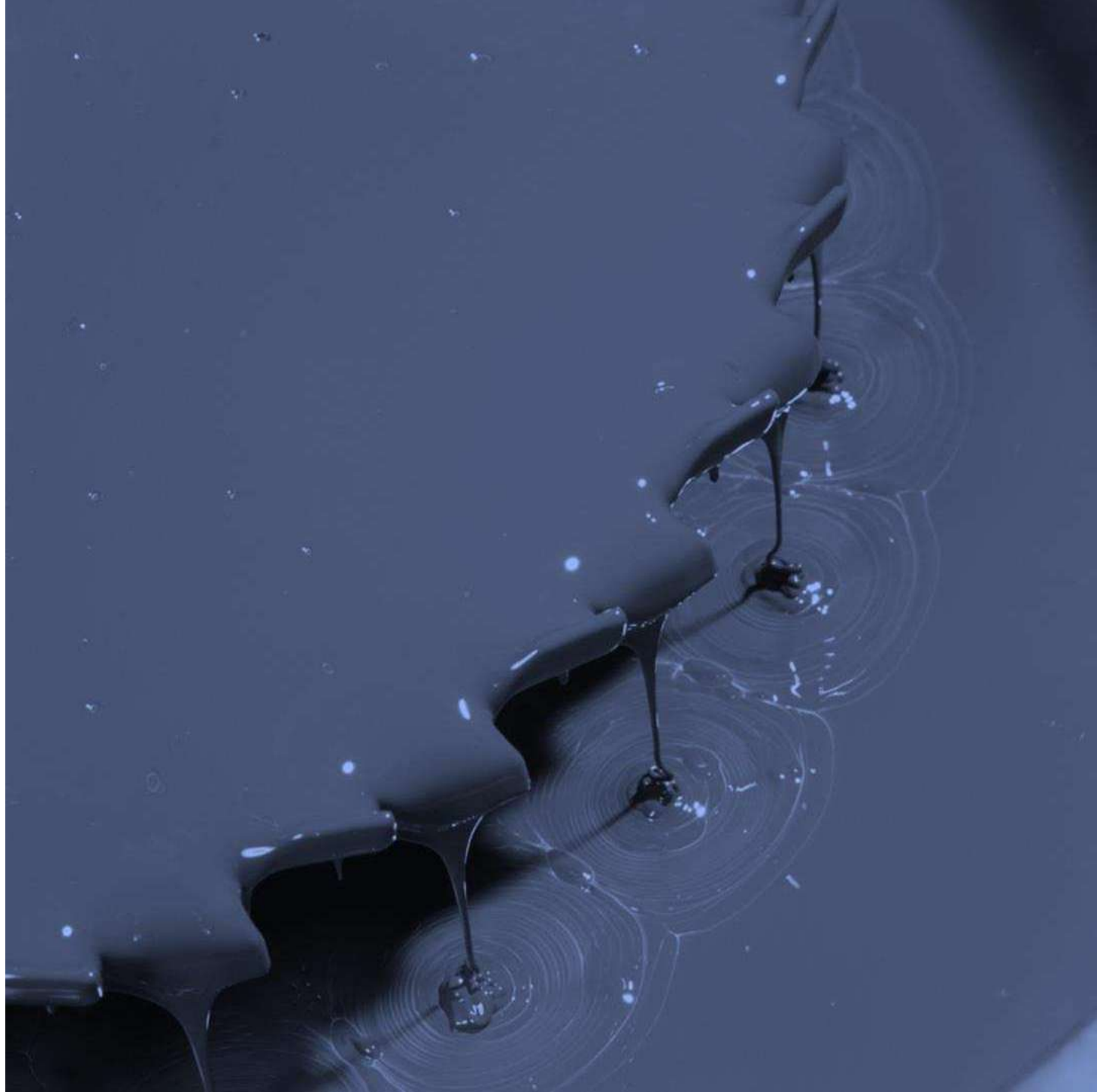
Multifunctional wetting agents for waterborne paints

Speaker: Aleksandr Senchev
Project Manager of Sinotek Company

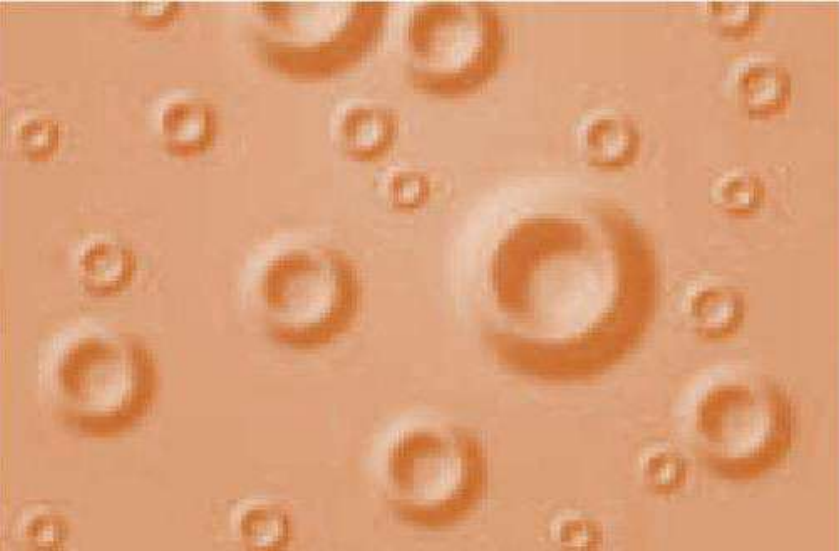


There are currently thousands of different functional paint additives. Requirements for coatings are becoming higher, so additive synthesis technologies are becoming more complex.

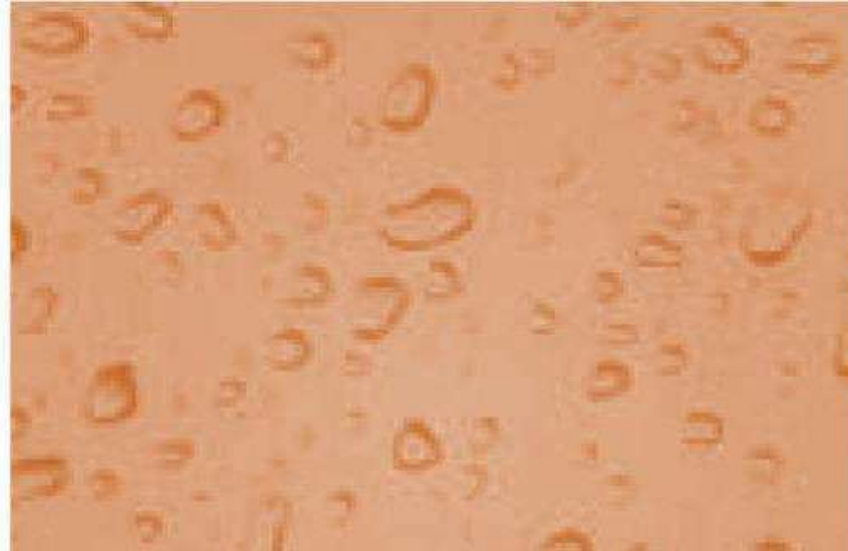
Modern paint coating is a complex combination of various components. The correct selection of these components ensures the quality and durability of the coating.



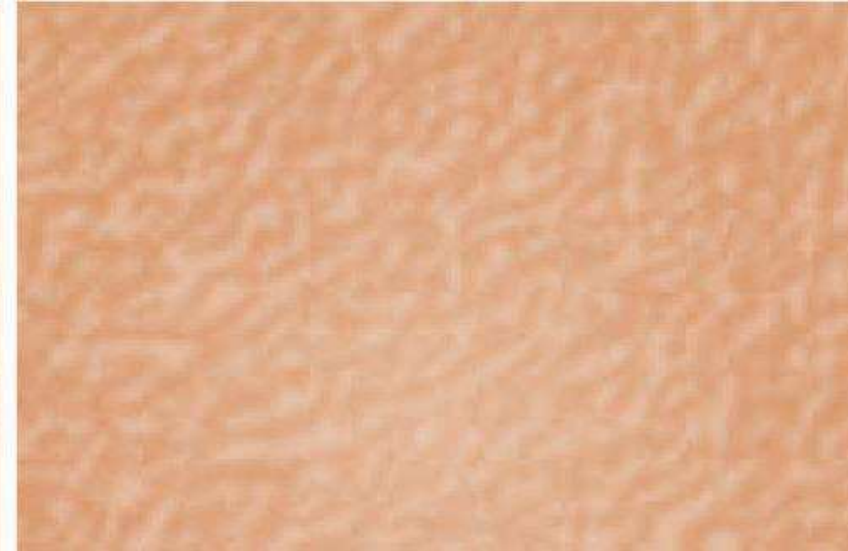
Most common surface wetting problems



Craters



Film retraction

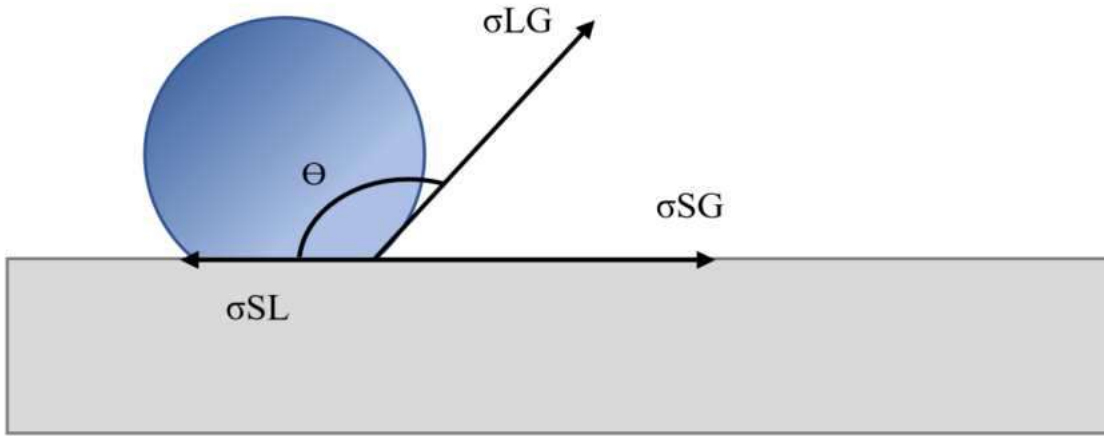


Orange peel

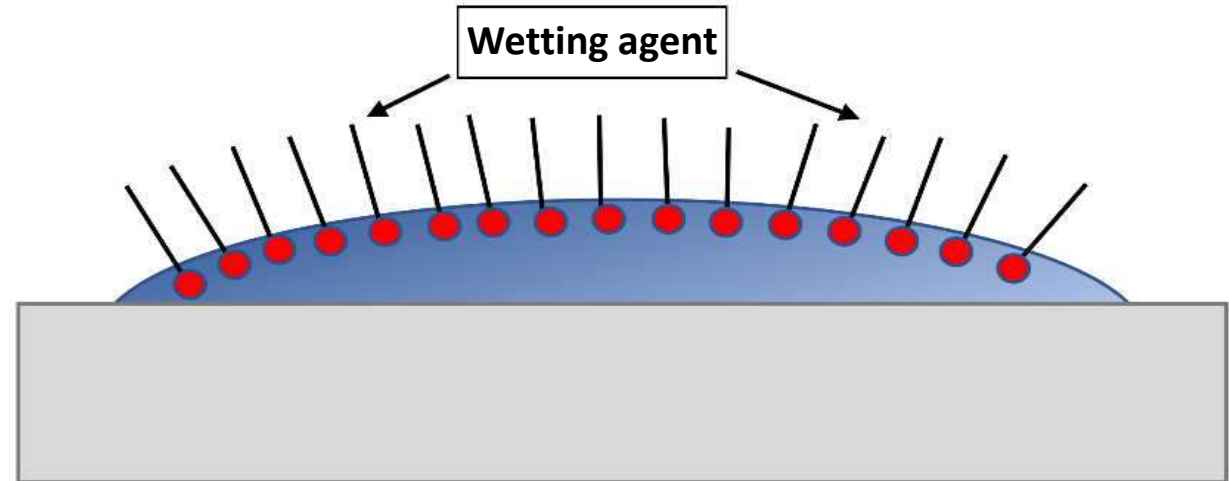
Which product should you choose?



Wetting agents



$$\sigma_{LG} + \sigma_{SL} > \sigma_{SG}$$



$$\sigma_{LG} + \sigma_{SL} < \sigma_{SG}$$

σ_{LG} - Surface tension of liquid (liquid-air interfacial tension)

σ_{SG} - Surface energy of solid (solid-air interfacial tension)

σ_{SL} - Solid-liquid interfacial tension

Main types of wetting agents for waterborne coatings

Ethoxylated fatty alcohols

- Isotrideceth-3...8
- Laureth 2...7
- ethoxylated alkylphenols

01

Salts of sulfosuccinic acid esters

- disodium laureth sulfosuccinate
- Sodium
- dioctyl sulfosuccinate

02

Silicone wetting agents

- siloxanes modified with polyesters
- trisiloxane ethoxylate

03

Parameters for assessing the effectiveness of wetting agents

Minimum surface tension of the solution



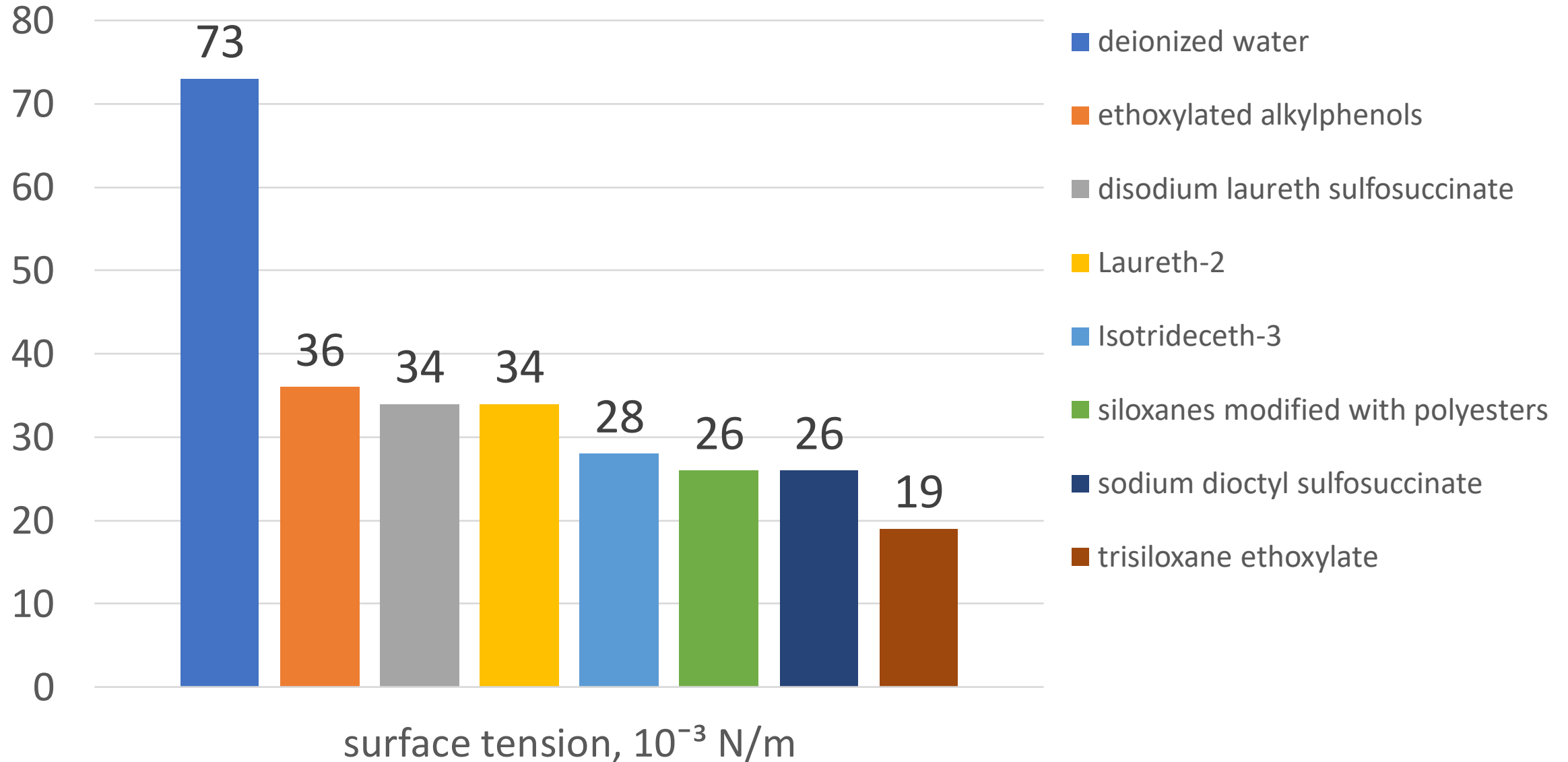
Effective dosage

Surface wetting speed

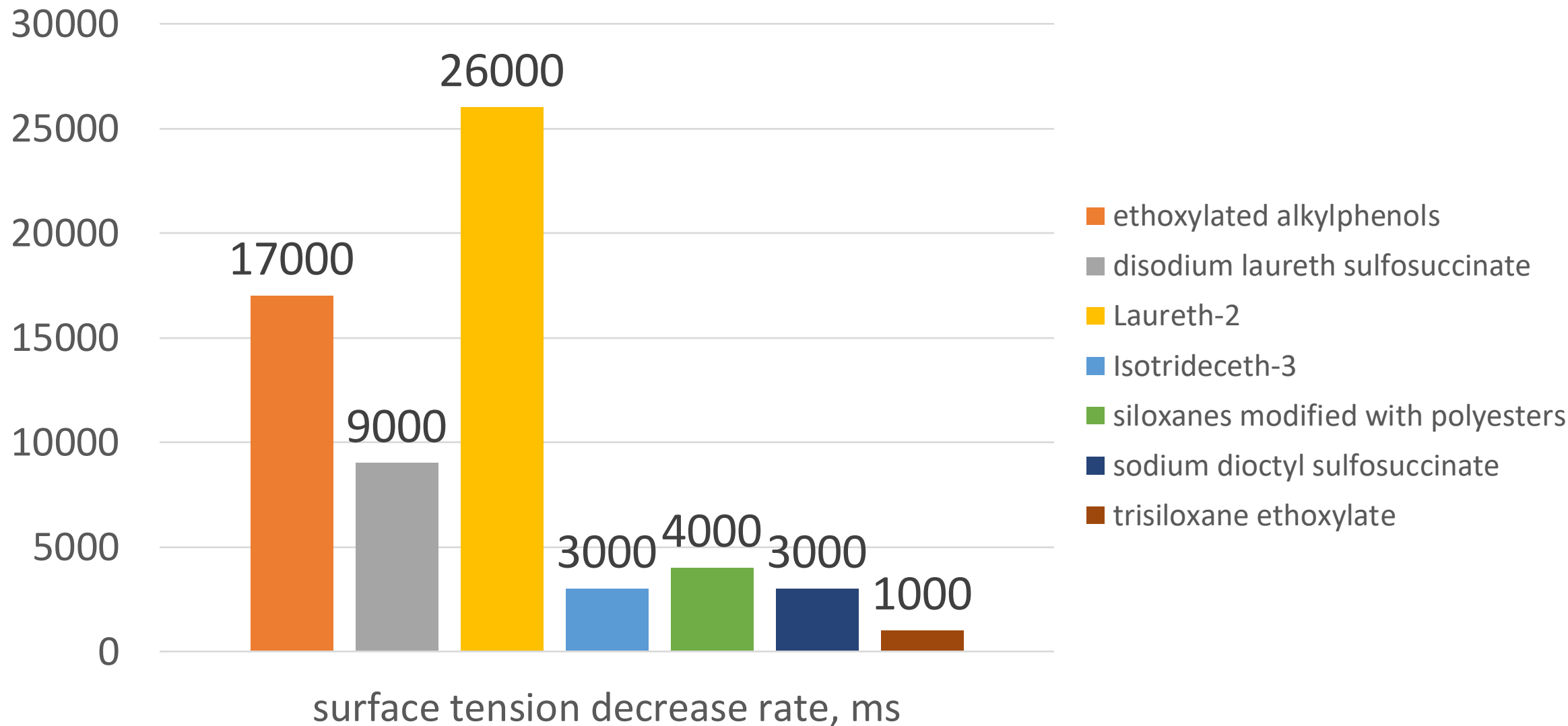


Effect on surface quality

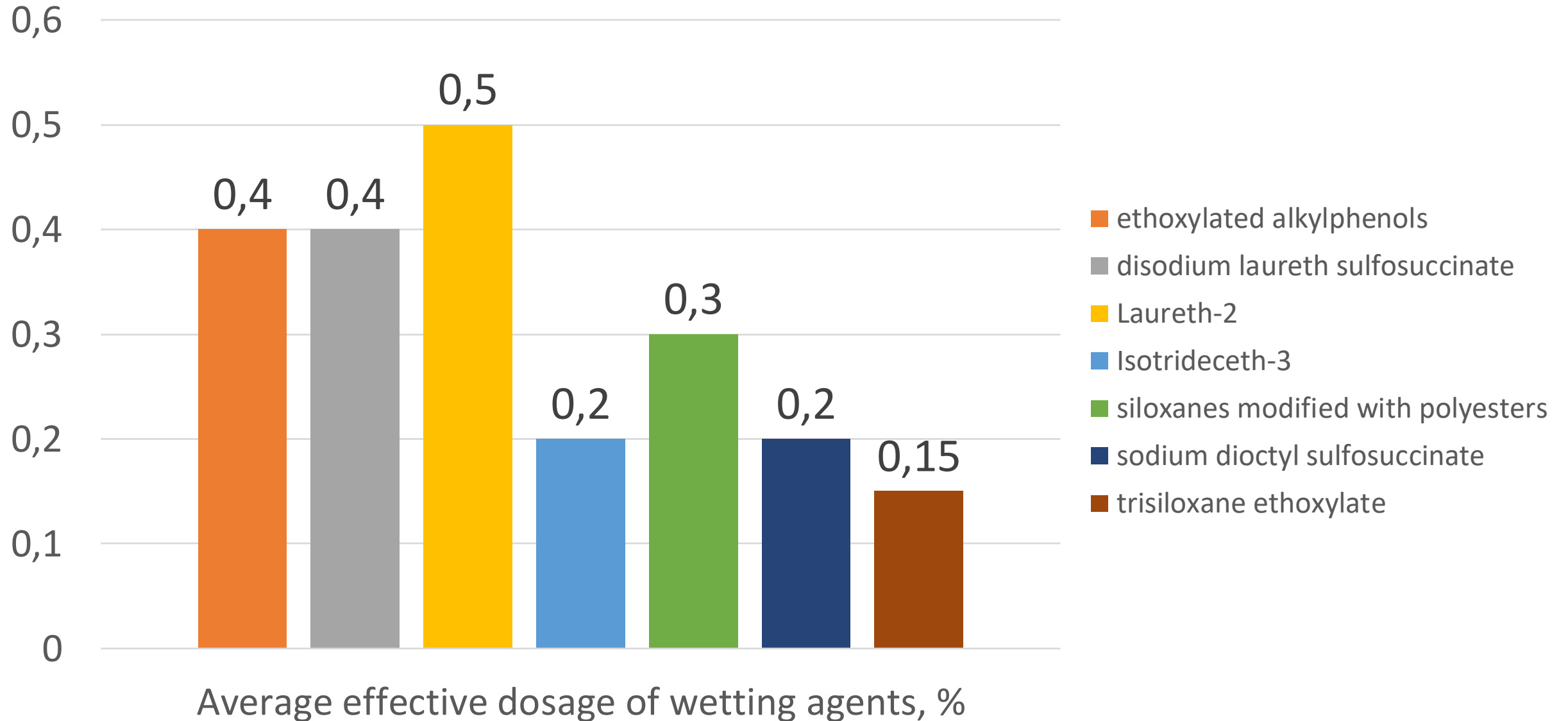
Minimum level of surface tension of 0,5% aqueous solutions



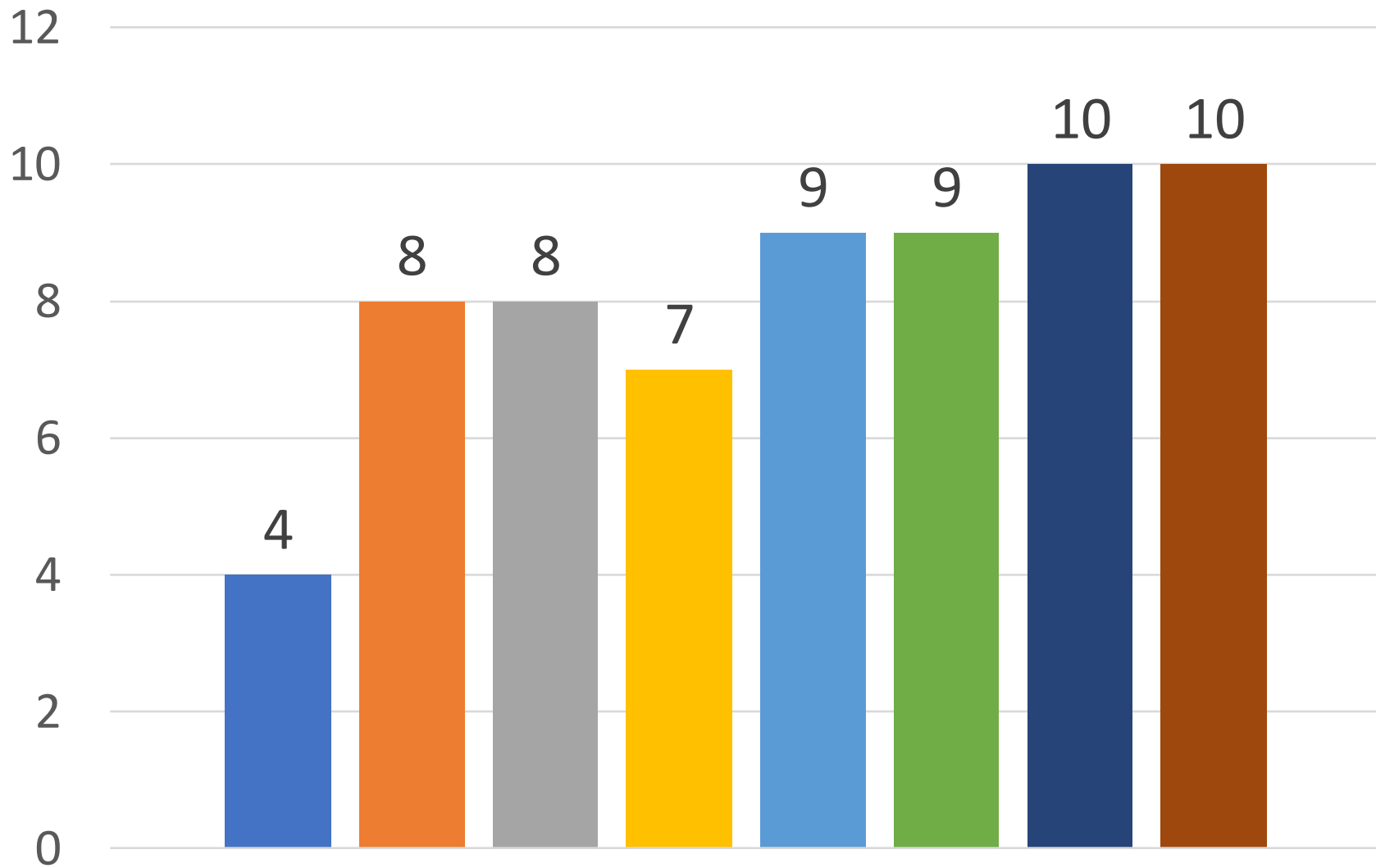
The rate of decrease dynamic surface tension to a minimum, at a dosage of 0.5%



Average effective dosage for use in waterborne paints, %



Surface quality on a 10-point scale



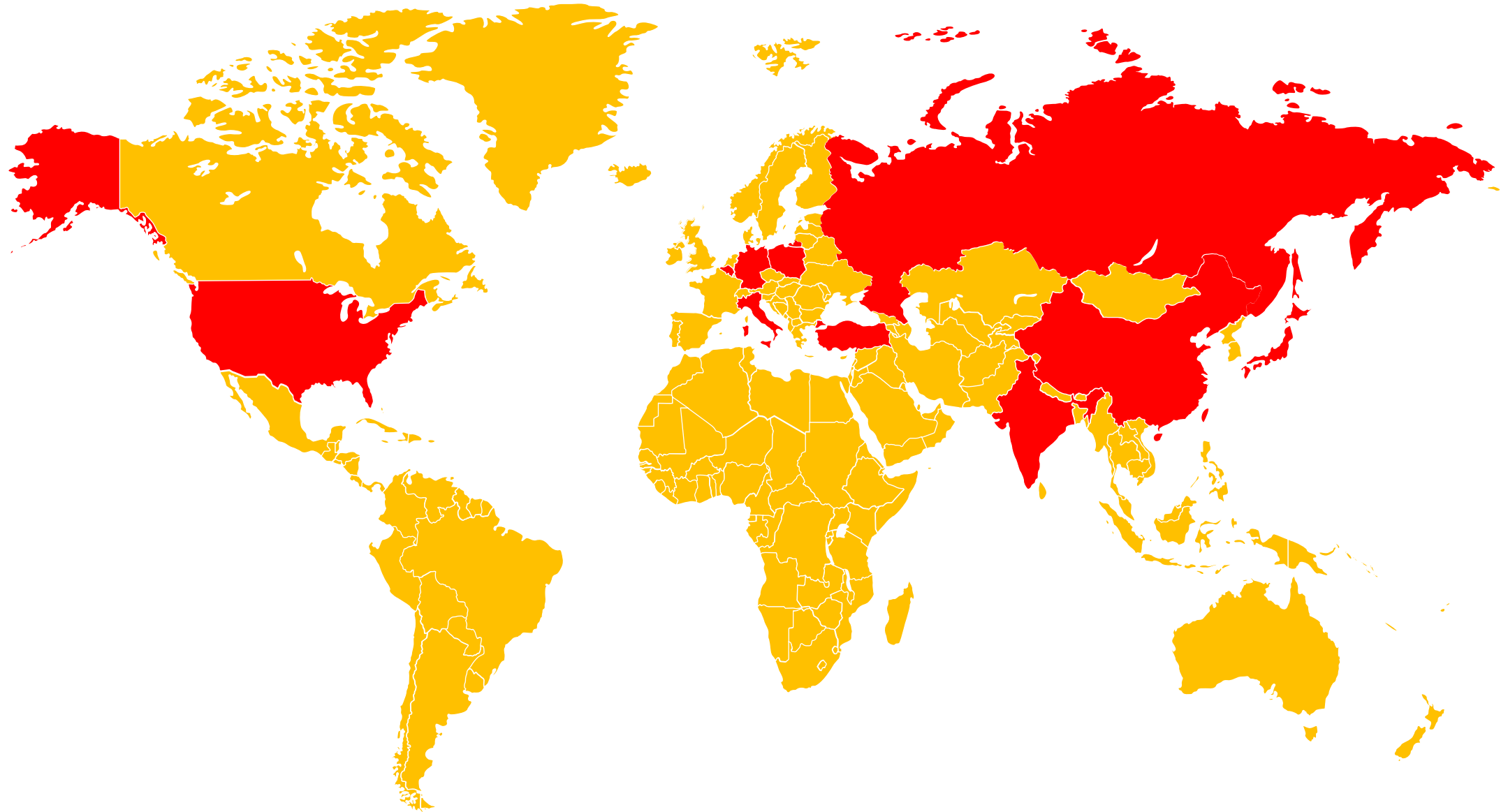
- without wetting agent
- ethoxylated alkylphenols
- disodium laureth sulfosuccinate
- Laureth-2
- Isotrideceth-3
- siloxanes modified with polyesters
- sodium dioctyl sulfosuccinate
- trisiloxane ethoxylate

Surface quality, points

The main requirements for a wetting agent

- **Uniformity of paint application to the surface;**
- **Low foaming;**
- **Wetting agent compatibility with other paint components;**
- **Formation of a coating without defects;**
- **Low toxicity.**

Main manufacturers of wetting agents



Main manufacturers of wetting agents

- Turkey (Sinotek Company);
- Russia (SynoTech LLC);
- China (10+ Companies);
- USA (DOW Chemical, Huntsman);
- India (Indofil Industries Ltd);
- Germany (BASF, BYK Chemie, Münzing);
- Poland (PCC Group);
- Italy (SABO);
- Belgium (Solvay);
- Japan (San nopro, KAO)

$\sigma, 10^{-3}\text{N/m}$

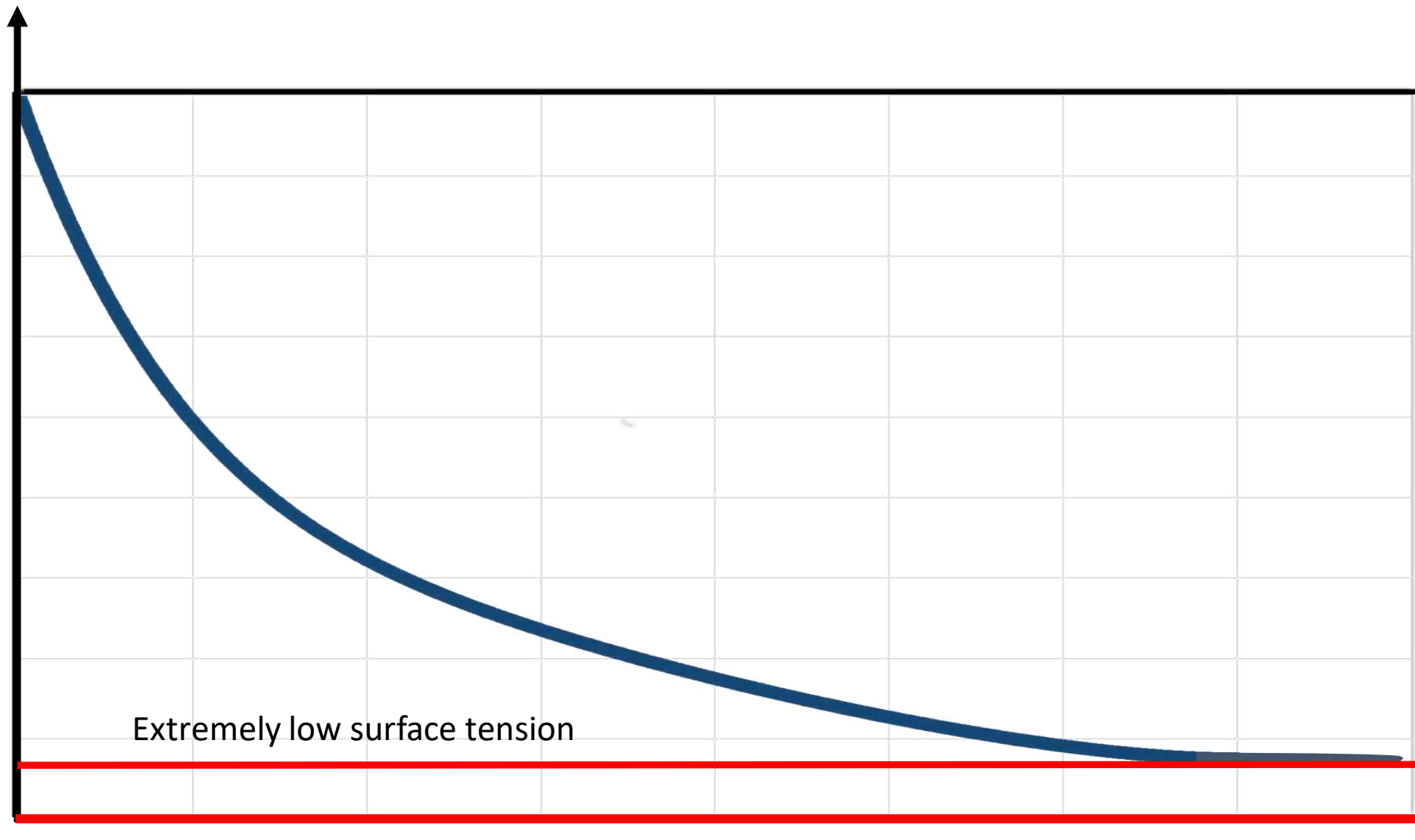
73

35

0

Extremely low surface tension

Wetting agent dosage, %



The effectiveness of monofunctional wetting agents is approaching its limit, so one of the important directions is the production of multifunctional chemical compounds that will combine 2 or more functions:

- Wetting agent with dispersant function;**
- Low foam wetting agent;**
- Wetting agent with dispersant effect and reduced foaming**

Thank you for attention

